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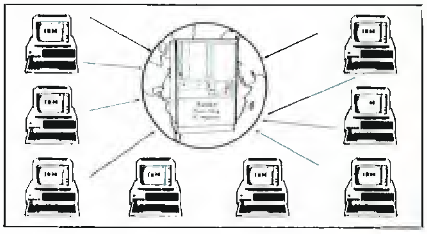

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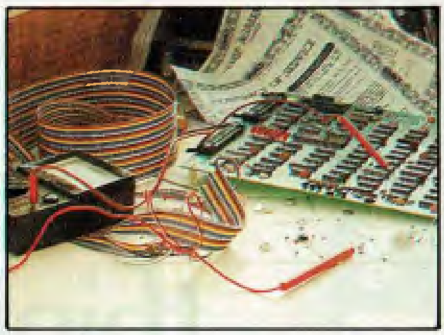

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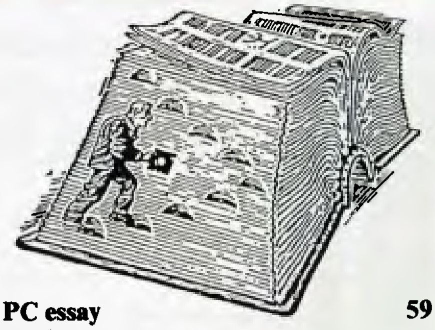

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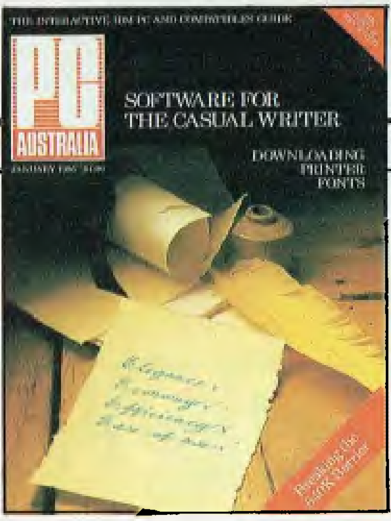
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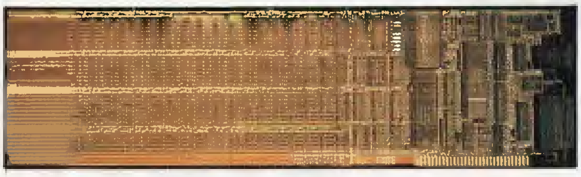

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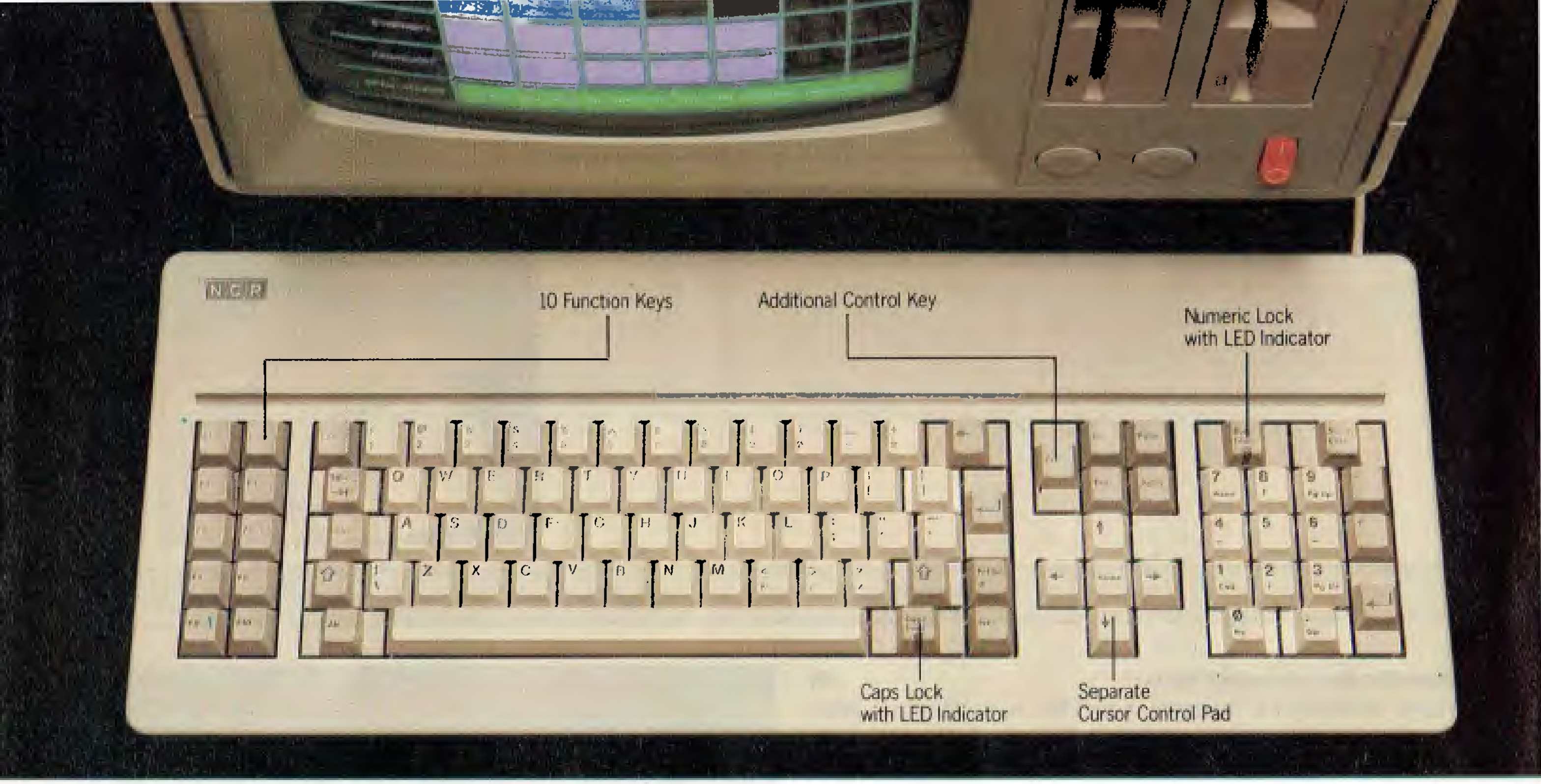
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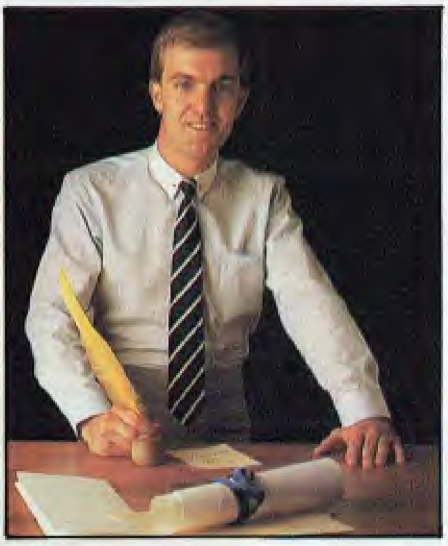
Raising the standard

Although the IBM PC now reigns supreme as the worldwide standard in business personal computing, there is a strong chance that the original PC — the old five-slot, cassette-port-fitted, 63W system that sparked a worldwide revolution — will not see out its fifth birthday later this year. Instead, IBM's base model PC is likely to become the eight-slot, non-cassette, 130W stripped-down XT, which was introduced early last year.

Nevertheless, the IBM PC standard is set to dominate for many more years to come, despite other manufacturers' attempts to provide alternatives (See 'Death of the Mac Office' on page 17). However, it is important to note that it is the PC standard that has survived and matured, rather than an individual product, and that this progress has been shaped by an entire industry rather than by IBM in isolation. The continual improvements in PC-DOS (versions 2.0, 3.0 and so on) have been pioneered by the programmers at Microsoft, PC modem communications have been standardised by the Hayes command set, the PC printer standard has been set by Epson, the PC Network evolved from Systek, and the most recent breakthrough — that of extended memory, was spearheaded by Lotus and Intel. (More about this can be found in 'Breaking the 640K Barrier' on page 48.)

So what improvements to the PC standard can we look forward to in 1986? First of all, following the long-awaited release of IBM's Enhanced Graphics Adapter (EGA), the Australian market will soon be flooded with a range of EGA-compatible hardware, together with a colorful cornucopia of software supporting that standard.

Secondly, PC networking on a large scale will finally come into its own as the IBM token-ring network and its many compatibles make their way to Australia. This will in turn prompt the proliferation of extensive PC-to-mainframe links, and hopefully a well-defined standard will also emerge.



Another fundamental enhancement to the PC standard which we can expect some time this year will be that of multitasking, provided PC-DOS 4.0 materialises according to plan. Although various methods have already been devised to provide multitasking on the PC, no reliable standard will emerge until PC-DOS 4.0 leads the way. One of the prerequisites for a successful implementation is copious amounts of memory, and fortunately Microsoft has already announced that future versions of PC-DOS will support the Lotus/Intel standard (which is now to be called the Lotus/Intel/Microsoft standard!).

Unfortunately, the popular 'hot key' method to be used by future multitasking versions of PC-DOS is certain to conflict drastically with the multitude of co-resident utilities now on the market, each of which use incompatible 'hot key' methods, and most of which are not at all keen to co-reside with their peers. So while PC-DOS 4.0 may set a long-awaited standard, it will create havoc (temporarily) in certain market sectors. After all, co-resident utilities are only fudging what a decent multitasking operating system should provide anyway.

Moving to the realms of the wishful thinking department, 1986 may well see a final commitment by IBM to the 3.5 inch disk drive and, following on from this, to a possible IBM standard in laptop personal computing. But then again, for the last four years, each New Year has been mistakenly heralded as 'The Year of the Portable', and nobody really wants to fall into that trap again. While on the subject of avoiding traps, I won't speculate further on the arrival of the mythical 'PC-2' desktop which has been repeatedly denied by IBM.

Another exciting development which may eventually lead to further enhancements of the business computing standard is the release of the Commodore Amiga supermicro, which should be available in quantity locally by March or April. Just as the arrival of the Macintosh spurred development in windowing operating environments, screen painting programs and icon-based software for the PC, so the Amiga should push the state of the art a little further. Unlike the closed-architecture Macintosh, the innovative Amiga can emulate the IBM PC, and therefore provides that all-important link to the mainstream of business computing. The Amiga, given appropriate marketing and consumer acceptance, has the potential to totally redefine expected standards of sound and graphics quality in microcomputers —two areas in which the PC standard could do with further refinement.

So, an interesting year lies ahead for the Australian PC community — a community united by a common standard which, like a decent bottle of red, is set to improve and gain character with maturity.

Having said that, it's probably about time for a celebratory New Year's drink . . . Cheers! ■

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GUEST EDITORIAL • RON JEFFRIES

Future DOS directions

Where is PC DOS headed in the next few years? Rapid improvements in PC hardware such as powerful, new, 32-bit microprocessors, multiple megabytes of cheap RAM, bigger disks, and better displays make it obvious that DOS will change. It has to. So the question becomes, "How will it change?"

Since Microsoft developed PC DOS for IBM and sells MS DOS to other manufacturers, I asked its chairman, Bill Gates, about his views on operating systems and related hardware trends during the next two to five years. Gates is fun to interview, as enthusiastic now as I imagine he was 10 years ago when he and his Harvard roommate, Paul Allen, wrote the first microcomputer BASIC.

Microsoft has a long-term agreement to work with IBM on future operating systems and related system software, so he was understandably careful about being quoted on certain PC DOS developments. But it is impossible to talk with the irrepressible Gates for more than five minutes without picking up a few tantalising clues about the direction he thinks both DOS and hardware development will take in the future.

According to Gates, there is a strong conservative influence on DOS. Microsoft is committed to having DOS remain compatible across the full spectrum of existing PCs. There is a huge installed base of IBM PCs and compatibles, with literally thousands of existing PC software packages that depend on current versions of DOS. Any changes to DOS have to be made very carefully so that all the existing programs will still work correctly.

Likewise, once a new feature goes into DOS, it's almost impossible to remove it. "You've got to be sure any change to the operating system is something you're willing to live with for a long, long time. For example, anything we did back in Version 1.0 of DOS — say we don't like it anymore — well, it has to be there, because those applications still have to run," Gates said.

But that doesn't mean DOS is a static, unchanging entity. Since memory is now much cheaper than when DOS was originally designed, it will be practical to add a number of memory-gobbling but useful features to DOS in the future. Possibilities include multitasking (so that multiple programs can run at the same time), an easy-to-use visual user interface, more-powerful networking capabilities, and support for optical disks. Best of all, the cryptic 11-character DOS filenames are likely to be augmented with a longer, more meaningful description for each file.

Several visual user interfaces or "window managers" are competing for the attention of PC software developers and users, including *Top View* from IBM, *Microsoft Windows*, and *GEM* from Digital Research. Which will win? Since IBM and Microsoft now have an agreement to collaborate in developing future operating systems and other systems software, an obvious question is whether *Top View* and *Windows* might converge into a single interface for a future PC.

During the past year Microsoft has worked hard to make *Windows* more compatible with *Top View*. For example, it now uses *Top View* PIF (product information files) to define the requirements of a given program. Microsoft has even been going around to software developers and strongly encouraging them to make their programs "*Top View* aware" — in other words, use PIF files — to enable *Windows* to handle existing programs.

Since everybody — IBM, Microsoft, software developers, and users — will benefit from an early resolution of the visual user interface issue, my hunch is you'll see *Top View* and *Windows* combined before long.

If you are a mouse hater, don't despair: Even when a visual user interface such as *Windows* becomes standard on future PCs, you will still have a command-driven interface, because it's needed in order to support batch files. "We will always have batch files, but the command interface probably won't be taught in the standard DOS manuals over time," Gates said.

Gates is confident that the Intel processor family — 8088, 8086, 80286, and the coming 80386 — will continue to dominate personal computers for the office.

Gates says the Intel 80386 processor will be about three times faster than the 80286, similar to the 80286's speed advantage over the original 8088. But when the 80386 first comes out, it will not offer that much of a speed advantage, since early production chips usually run at a slower clock rate.

Don't plan on a 80386-based PC for about another two years. "I caution people about how quickly the 80386 is coming along. In terms of really getting it into existence, it is still probably more than two years away.

If you have been dreaming of a supersmart personal assistant inside DOS that will correct common errors, dream on; it won't happen in the next five years. According to Gates, artificial intelligence (AI) techniques won't be incorporated into the operating system until applications software using AI proves its value.

By 1995 — and maybe even sooner — Gates thinks that you will be able to purchase a desktop computer for about $10,000 that uses as many as 32 Intel 80386 processors — or even the next generation of processors after the 80386. "You get all those chips working together, and that's absolutely mainframe performance," he said with a chuckle. ■

Ron Jeffries is a regular contributor to PC Magazine.

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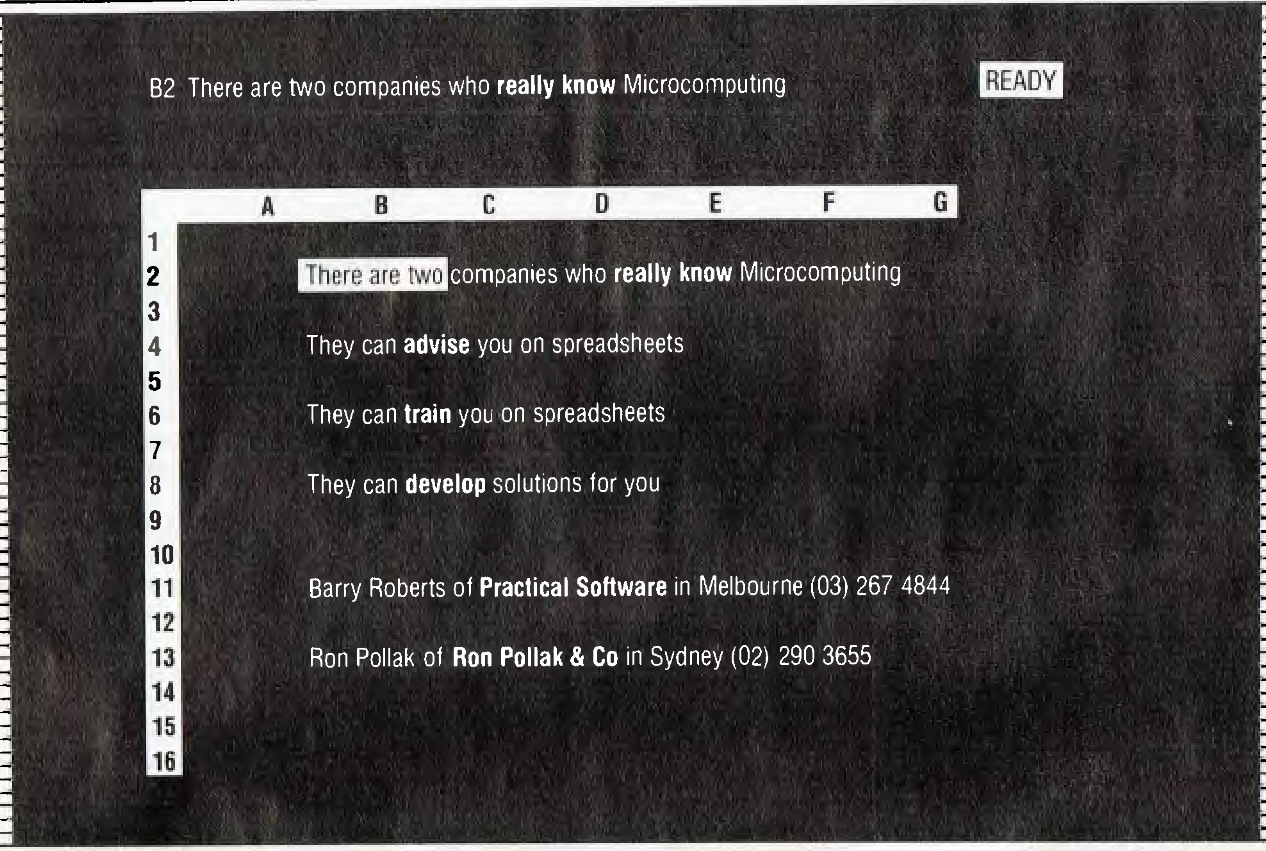

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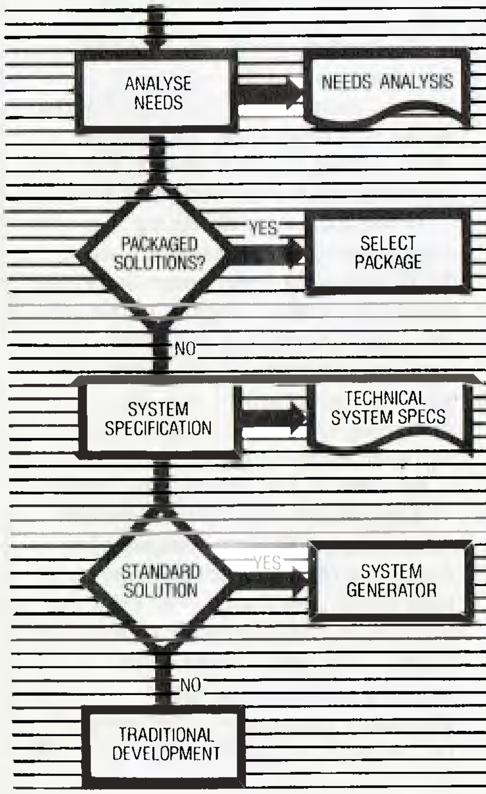

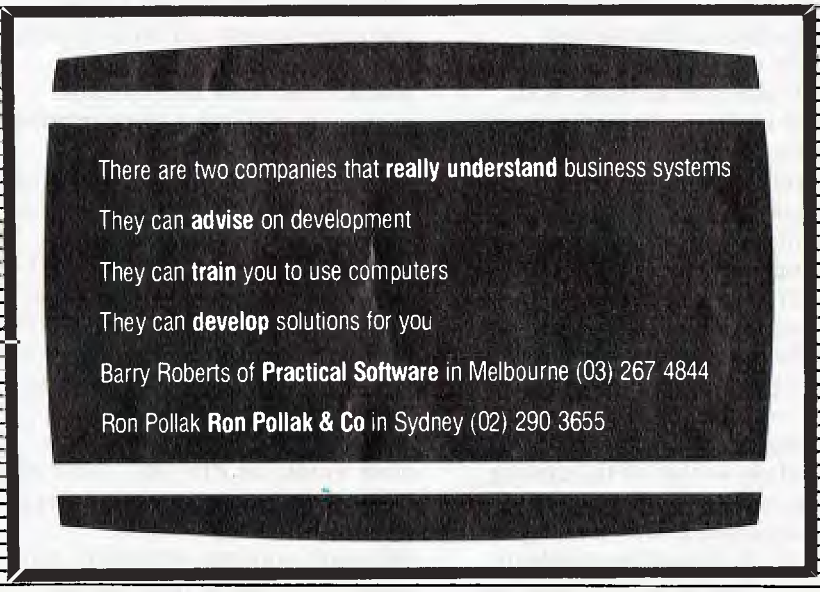

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Sydney NSW 2001

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PO Box 4720 Spencer Street
Melbourne Vic 3001

Positive feedback

With only four issues published, *PC Australia* has already made its mark on the PC community. Letters to the Editor have been arriving daily (postal strikes notwithstanding) from across the country.

Comments from Tasmania

Could I make a few comments on the November issue of *PC Australia*? I was disappointed to note that the article dealing with project management did not actually look at some of the software available and hope that a future issue may be able to do so.

As far as the article on brainstorming went, we did not see anything in the text outliners that our *Word Perfect Version 4.0* word processor would not do. This program has automatic paragraph and outline numbering and both are very easy to use. It too works on indents to generate levels of numbers and sub-numbers which look a bit like the 'Wines in Western Australia' example on the first page of the article.

We look forward to receiving future issues of the magazine.

C. M. Wegman
Crawford Cripps, Wegman (Architects)
Hobart, Tas.

Several reviews are currently being prepared on the leading project management packages for the PC and readers can expect to see these soon. Like accounting software, it takes an expert user many months to fairly review such sophisticated packages, but the end result is well worth waiting for, if you are seriously considering purchasing such a package. — Ed.

The anthropological PC

I recently received a copy of *PC Australia* from Perfect Information and am very impressed.

I am in the process of selecting a computer for my Ph.D. anthropology fieldwork, a complex task as anthropologists tend to use card systems in tin boxes (one of the 'urban myths' of anthropology is about the fieldworker who discovered the white ants had eaten two years' work), so there is no tested and proven PC system. I have narrowed the field to either the Toshiba 1100 or the Kaypro 2000 with *Perfect Writer* and *Filer* and I am tilting towards the Kaypro after reading in your Toshiba review about its lack of a future hard disk option.

I expect to buy either machine in about four months and would not like to miss any editions of *PC Australia* because I don't presently have an IBM compatible machine. If you could make an exception and continue sending me your magazine I promise to be glowing and public in my praise of it and you.

Many thanks and good luck for future issues.

Ronald Moss
Annandale NSW

As PC Australia *is available free of charge to all PC users, not just owners, I see no problem in adding you to our mailing list. I hope Clive Lassiter's review of the Kaypro 2000 in last month's issue helped you make your final selection. — Ed.*

Even ads are worth reading

Regarding *PC Australia*: If you can keep up the standard of your first and second issues you're on a winner. You have achieved the right balance as far as I'm concerned — even the ads are worth reading!

Jim Sly
Department of Law
Darwin, NT

Coursemaster developers respond

Thanks for the excellent coverage of *Coursemaster*. John Hedberg has written an informed article on both *CAL* and *Coursemaster* itself. Recent enhancements of *Coursemaster* now provide 'fuzzy match' keyboard entry, communications capability and advanced course management features. We look forward to sharing the ongoing success of *Coursemaster* with yourself and your readers and congratulate you on a fine publication.

Bruce Olive,
General Manager,
Australian Industrial Publications
Hawthorn, Vic.

Our ***Coursemaster*** *review (*PC Australia, *November 85 p52) has generated a great deal of interest and we intend to continue highlighting top locally-developed products such as this. John Hedberg will re-appear in* PC Australia *from time to time, as our computer-assisted learning (CAL) expert. — Ed.*

A final word from the west

In response to your request for feedback to your new magazine, may I first congratulate you on publishing *PC Australia* and at the same time thank you for the free subscription. My staff and I particularly find the 'User-to-User', 'Tech Notebook' and 'Spreadsheet Clinic' very useful and informative.

However, I do have one constructive comment to make. Your article 'Project Management Software' in the November 1985 issue was quite enlightening. However, a list of the available software for project management was missing from the article. A review or a list of the software should have been included with the article to enable consultants such as our firm to evaluate the alternatives available.

Perhaps in the future when articles are written on specialised topics, reviews on the applicable software packages will be included. May I also wish you well with the future issues of your magazine.

T. M. Fagan
Managing Director,
Computer Selections
Subiaco, WA.

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In this section we outline some of our new products just released in Australia at our Special Introductory price. This month

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Sidekick (unprotected)	$95
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PC~telex link offers time savings

Local companies Telexon Data Systems and Offcom have unveiled the Big Blue telex system, giving IBM PC and compatible users low-cost, time-saving access to local and overseas telex networks. Telexes may be created and formatted on the PC using an existing word processing package, or from within the Big Blue telex system. These telexes may be transmitted immediately, or added to a disk queue for later transmission. Telexes may also be received at any time. This can occur in background mode while the PC is involved with other processing tasks.

The Big Blue telex software module is an extension of Offcom's Telex Operating System (TOS). TOS replaces the traditional telex machine and allows the storage and forwarding of incoming and outgoing telex messages. In producing a telex, the PC user can select either local or international telex mode. The international mode is handled via Telexon Data System's international telex network links.

Telexon is a wholly-owned subsidiary of the London-based company Vitel, which operates a worldwide network of communications centres. In transferring data at high speed through its network, Vitel offers the opportunity to obtain substantial savings when compared to direct telex costs. The combination of the Offcom TOS package with the Vitel International telex links is claimed to provide savings of up to 30 per cent for international telex traffic, and up to 50 per cent on local messages.

The menu-driven software takes care of tedious telex entry tasks, such as headers and telex answerback details. The operator simply enters the destination number and country code, types the message on the computer keyboard, edits as required, and files on disk for immediate or subsequent batched transmission. The Vitel network then provides high speed transmission to the country of destination.

Connection costs are also minimised as the PC connects to the telex network for the cost of a local call. A log of all incoming and outgoing telex messages is automatically generated. A separate international report is also provided every 24 hours, outlining all usage details on the international telex network. The Big Blue telex can interface to mainframe and minicomputers to act as a central store and forward device, in such a way that all terminals on the network (local and remote) can download telexes. Local area networks (LANs) may also be accommodated, allowing all workstations immediate telex access.

PC AUSTRALIA TOP TEN

1.	**1-2-3**	— *Lotus Development Corp.*
2.	**Multimate**	— *Multimate International*
3.	**Open Access**	— *Software Publishing Inter.*
4.	**dBase III**	— *Ashton-Tate*
5.	**Dataflex**	— *Data Access Corp.*
6.	**WordStar**	— *Micropro*
7.	**Symphony**	— *Lotus Development Corp.*
8.	**Multiplan**	— *Microsoft*
9.	**Crosstalk XVI**	— *Microstuf Inc.*
10.	**Word (PC ver.)**	— *Microsoft*

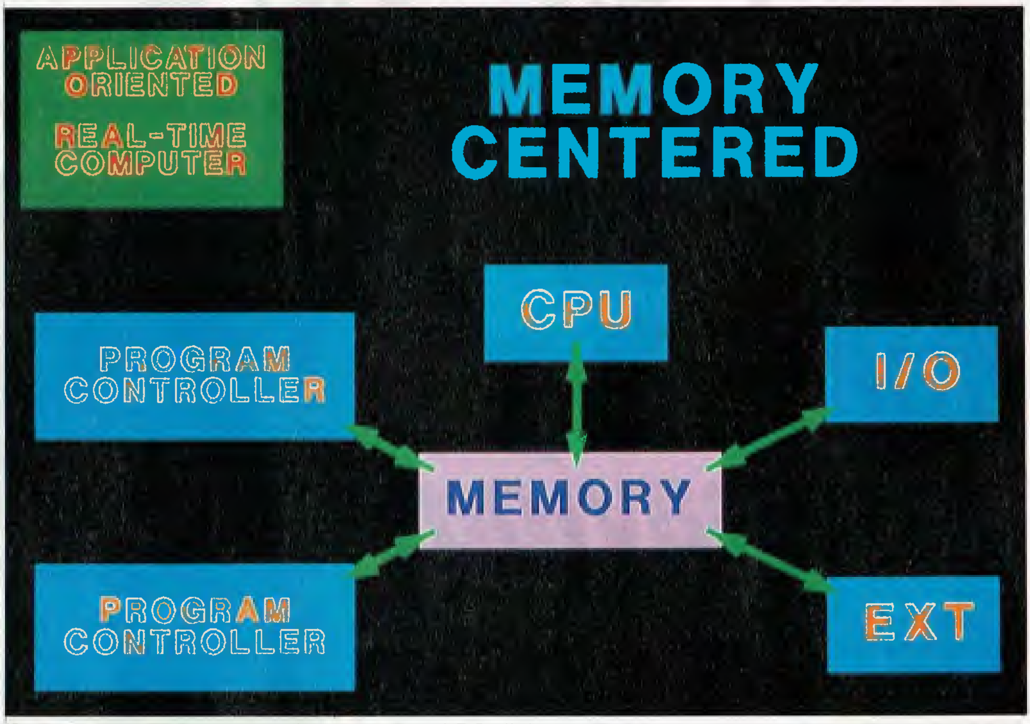
The PC Australia Top Ten is derived from monthly surveys of over 240 PC software outlets by Focus Research.

Bureau service for PC slides

Dimension Graphics, based in North Sydney, has established a high-resolution slide transfer bureau in co-operation with the Penta photographic house, which will prepare presentation-quality slides from PC data or screen images. Based on the Mirage graphics software, the bureau service will provide 2000 or 4000-line high-resolution 35mm format slides from images supplied on standard PC disks.

The managing director of Dimension Graphics, Kim Ong, claims that this reduces preparation costs to less than $8 per slide, and provides the added customer advantages of professional advice on choices of color, typestyles and layout. This method of in-house slide presentation is claimed to be far cheaper than other commercial alternatives, the copy and data proofing stage being eliminated because the customer examines the completed image on his own PC screen before sending it to be processed.

Future enhancements to the service include the ability to work from Lotus 1-2-3 PIC files, and a modem transfer facility that allows images to be transmitted directly to the service across the telephone line.



Quality slide presentation from standard PC disks

IBM combines PC and System/36

A new desktop version of the prolific IBM System/36 has been released by IBM Australia. It consists of the desktop 5364 processor (mounted in an AT-like box) and a PC, which can function as either the system console, a System/36 terminal or a standalone PC.

The multitasking System/36 PC can support up to four workstations, including any combination of System/36 terminals, PCs or printers. With the included PC Support/36 program, PC workstations can access data stored in System/36 format and a utility has been provided which converts data from standard 8-inch System/36 format disks to suit the new 5.25-inch disks in the System/36 PC.

The 5364 processor cable connects to an attachment card in the back of the console PC, which runs an attachment program that allows the processor and part of its memory to be used for System/36 diagnostics, maintenance and communications. Switching between PC Mode and System/36 mode is achieved by a special 'hot key' facility, similar to those used by co-resident utilities such as Sidekick. PC operations are temporarily suspended while in System/36 mode, until the user 'hot keys' back to PC Mode.

The System/36 PC will be marketed through IBM, existing System/36 dealers, and a new category of re-marketers known (in typical IBM style) as IBM 5364 Advanced Function Value Added dealers. Several companies are being considered for selection in this final category.

SCA launches internal PC modem

For almost a year, there has been no other Telecom-approved internal modem available for the PC to challenge the NetComm PC In/Modem. Finally, a competing product, the Data Express Intelligent Modem, has been launched by the Melbourne-based Software Corporation of Australia (SCA). Data Express has been manufactured by Sendata Pty Ltd specifically for SCA, which recently became a publicly-listed company on the second board of the Adelaide Exchange.

Like NetComm Data Express is a 'short PC card'. It recognises the Hayes standard command set, comes bundled with a videotex software package, and can handle 300 baud full duplex, 1200 baud half duplex, as well as the videotex split rate of 1200/75 baud.

Unlike the NetComm product however, Data Express has an extra RS232 serial port socket mounted in the back panel, and includes the popular communications software PC-TALK III.

Unfortunately, the VIP videotex software (developed by Trident Software), bundled with the Data Express will only display in monochrome, whereas the NetComm software does the best it can with the colors available. Other versions of VIP (such as that designed for the NEC APC 3) will display all eight videotex colors, but the assumption was made that most Data Express purchasers would have PCs fitted with either the IBM monochrome or standard color graphics adapter. ■

Macintosh becomes IBM peripheral

After finally scrapping its plans for the 'Macintosh Office' as an alternative to the IBM PC standard for business users, Apple Computer Corp. has thrown in the towel completely by announcing plans to make its Macintosh microcomputer compatible with IBM's recently announced token-ring network.

The link will incorporate Macintosh support for PU 2.1 and LU 6.2, IBM's peer-to-peer communications protocol for interconnecting all devices, and for DIA/DCA, the IBM format for moving documents throughout its networks. Apple will introduce this new series of 'connectivity products' over the next three to 18 months, according to the company president, ex-Pepsi Man John Sculley.

Sculley called the move "a major change in philosophy", admitting that Apple's previous refusal to recognise the IBM standard "left us isolated from the business mainstream of desktop computing". Former Apple chairman Steven Jobs had committed Apple to establishing its own office standard based on the monochrome closed-architecture Macintosh, and many industry analysts believe that the company's recent reorganisation, culminating in Jobs' resignation, was spurred in part by Apple's inability to crack the office market.

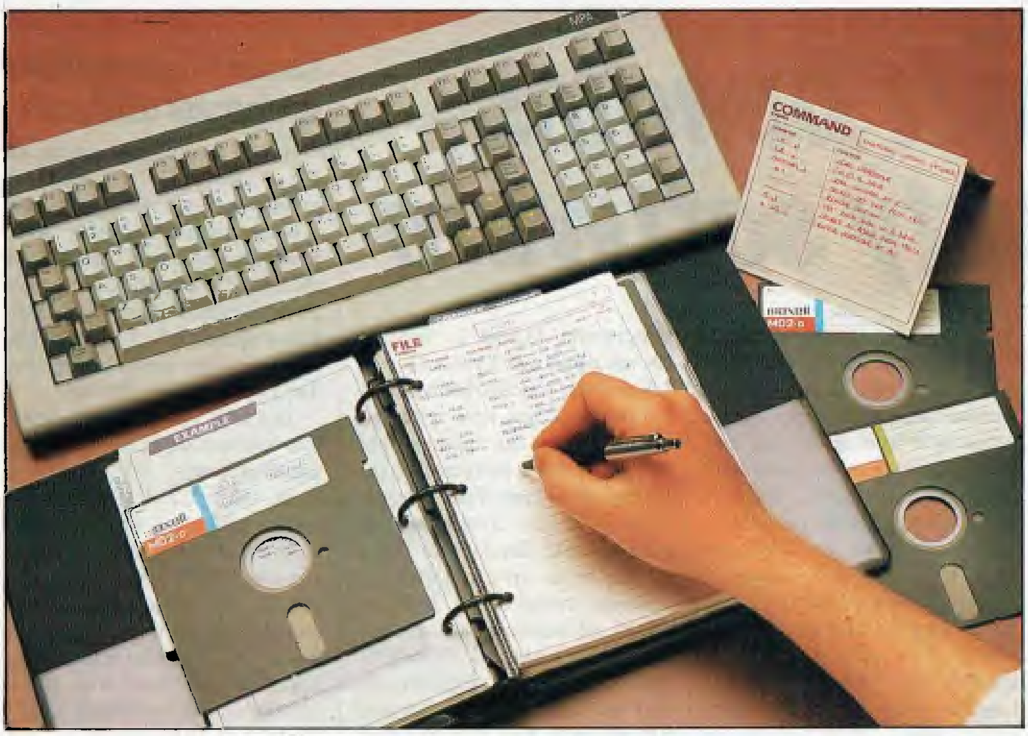
At a recent sales meeting, Sculley told employees that competing head-to-head with IBM for the broad business market "is not credible in perception or in fact." He claimed that the company was beta-testing a translator to make documents generated by its *MacWrite* word processing program compatible with IBM DIA/DCA format, and future products would provide access to DISOSS. Other new products will include up-grades to *Appleline,* which converts the Macintosh into an IBM mainframe terminal. If the relative success of Apple's Laser-writer printer is anything to go by, there could still be a rosy future for Apple as a manufacturer of IBM PC-standard peripherals.

Diary for PC users

For those PC users who made the same old New Year's resolution regarding cleaning up the masses of paper that surround the PC, Debden Diaries of Melbourne has provided a solution. The Computer Companion, a "computer management system" housed in a ring binder, allows the organised storage of all those vital notes and scribbles which are crucial to the day-to-day operation of a PC, in a format which is certainly neater than the average PC user's desktop.

The Computer Companion includes sections for customised command cards, BBS and information service numbers, electronic mail messages, disk file details, user group directories and a hardware maintenance log.

Also included are several disk storage pouches (for taking *Flight Simulator* home at night) and a ziplock pouch (for the pilot's reference card). A weekly calendar and an alphabetical index of computer contacts provide the finishing touches to a product that will certainly put the gleam back in the eyes of that PC user in your life.



The Debden computer companion — neater than the average desktop

Timeline developer joins PC Magazine

William Lohse, president of Breakthrough Software, has been appointed as publisher of *PC Magazine* in the United States. Lohse has relinquished day-to-day operating responsibility at Breakthrough and is in the process of selling his interest in the company, which developed and markets the *Timeline* project management package.

Lohse, who's keynote address at the APCON 85 convention in Sydney in September was about the PC industry's future, has no formal publishing experience, but was selected for his background in the personal computer industry and distinguished record in sales and marketing management. He entered the PC industry in 1976, as director of sales for IMSAI, the world's second microcomputer manufacturer, and progressed to become first director of sales at Micropro (where he helped to launch *WorkStar*). He then moved on to IUS as vice-president of marketing (where the first IBM PC word processor, Easywriter, was launched). He founded Breakthrough Software in April 1984, after IUS merged with Sorcim.

ACICS opens second shopfront

Following the reported success of the ACI Shop in Sydney (formerly the IBM Shop), ACI Computer Services has opened a similar PC shopfront operation in Melbourne, at 319 Collins Street. Plans are underway for a third shop in Parramatta. Prior to establishing these retail outlets, ACICS operated mainly from its capital city branch offices.

The speaker at the launch of the Melbourne ACI shop was Robert Gottliebsen, business commentator and group managing editor of BRW Publications. Gottliebsen claimed that the most intense battle in the local PC industry would be fought not in the headquarters of IBM, Apple or Olivetti, but in retail outlets in the central business districts of Melbourne and Sydney and the other state capitals. He noted that business market buyers were willing to pay to get PCs operational with a minimum of fuss, but did not want to shop around by rubbing shoulders with hobbyists and casual users.

Robert Gottliebsen: a battle looming to supply PCs to the business market

ACICS PC division marketing manager, Jim Monoghan, said that the company had nine retail outlets, and those in the heart of the central business districts represented an important link in the marketing chain. He also claimed that the shopfronts provided leads into other services provided by ACICS, such as larger computer systems, communications work, bureau services and training.

Microsoft bundles third party software

Microsoft says it plans to include a free copy of the *Ready!* outline processor with every copy of the PC version of *Word.* This follows an earlier similar announcement regarding the bundling of PC *Paintbrush* with every Microsoft Mouse. Similar arrangements linking the Microsoft Mouse and *Word* apply in the US where bundling dominates the PC marketplace, although the Microsoft announcement is the first sign of this trend in Australia.

The *Ready!* program, which normally retails for $150, is a co-resident outlining package developed by Living Videotex Inc, creator of *Thinktank.* This means that the user can switch between it and *Word* (or any other application program) with a single keystroke, without having to stop either program.

The bundling arrangement applies to the latest version of *Microsoft Word (Version 2.01),* which incorporates support for several new laser printers, including the Hewlett-Packard Laserjet Plus, Corona LP300, and Canon LBP, as well as the IBM Proprinter, Colorjet and Quietwriter Model 2. Support for the upgraded Epson JX and LX printers has also been added.

Microsoft has now well and truly entered the heavyweight PC application software stakes (alongside Ashton-Tate's *Framework* and Lotus' *Symphony),* as running both *Ready!* and *Word* at the same time requires an absolute minimum of 384K of RAM, necessitating at least one PC expansion board. *Word 2.01* and *Ready!* both support the new Microsoft Mouse Version 5.0, which is now sold bundled with *PC Paintbrush.*

Tandy AT-compatible undercuts IBM price

It had to happen sooner or later — Tandy Corp. in the US is preparing to release its very own AT-compatible computer, with a price tag at least $US1000 less than the IBM model. Although Tandy already offers one 80286-based system (the Tandy 2000), this has fared badly in the past due to poor compatibility.

The new Tandy AT-compatible will include 512K, serial and paralled ports, AT expansion slots, and 1.2M floppy disk drives, with dual-mode monitor adapter for either color or monochrome displays. Like the company's other PCs, the AT-compatible will come bundled with Tandy's DeskMate desktop-organiser software, and plans for a multi-user version of DeskMate are supposedly in the pipeline.

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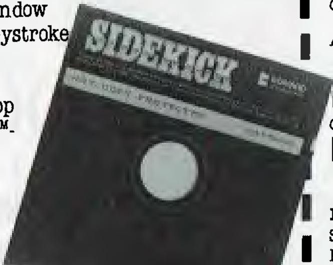
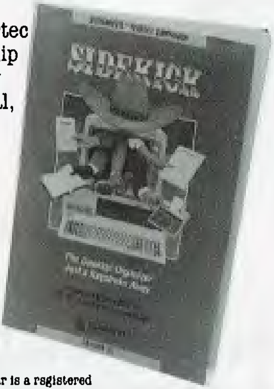
Infoworld acclaimed this valuable productivity tool as the U.S. Software Product of the Year. SideKick suspends your application program and opens a window with a single keystroke. Another keystroke brings you back to where you were instantly.

It includes the following desktop accessories: A full-screen Wordstar™-like word processor (allowing notes and edit files up to 25 pages long), an ASCII table for easy reference, a phone directory, a monthly calendar to year 2099, a datebook for those important meetings and appointments, and a full-featured calculator that performs decimal to hexadecimal to binary conversions. SideKick includes a comprehensive 120-page handbook.



HYPER-256 is warranted by Hypertec for defects in materials and workmanship for 12 months. SideKick is warranted by the manufacturer, Borland International, for 30 days from date of purchase.



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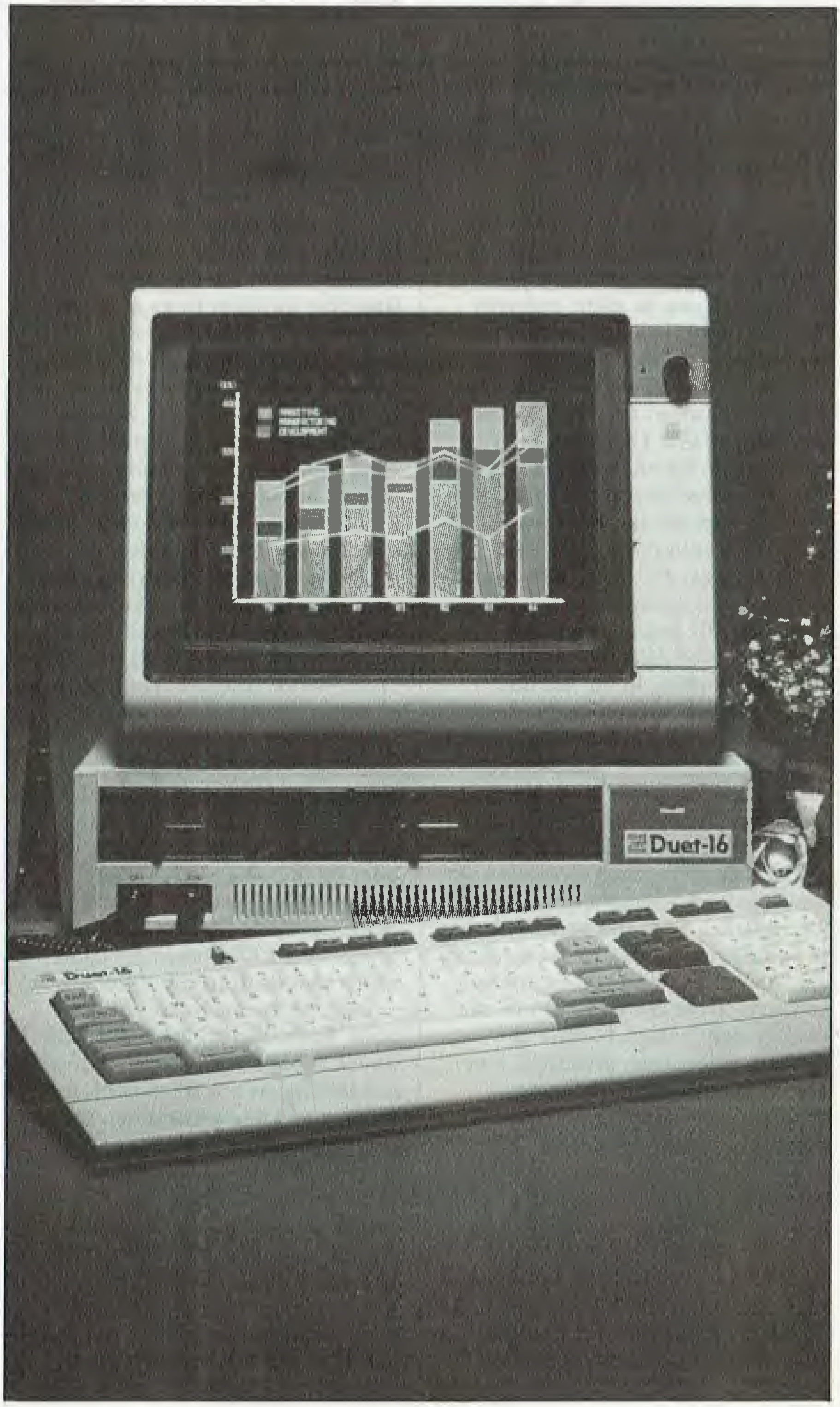
COMPUTERS WITH THE FUTURE BUILT IN

SBC Duet-16

The SBC Duet-16 is as PC-compatible as the NEC APC III, which means that it will happily run any MS-DOS applications written strictly according to the rules of MS-DOS. Unfortunately, too many packages sidestep certain calls to MS-DOS in favor of directly using the IBM PC ROM BIOS routines through software interrupts. When NEC first brought out the APC it was roundly criticised for not toeing the IBM line. Products like Microsoft *GW-Basic, dBase II* and *Lotus 1-2-3* had to be rewritten specifically. What most failed to grasp was that the departure from tradition was not merely a desire to avoid the "me-too" syndrome, but was to provide an MS-DOS machine with significant performance advantages over the IBM PC.

So too with the Duet-16. It seems that the primary incentive to depart from the PC standard was a decision to provide higher resolution color graphics. That meant a totally different internal video memory-mapping technique that required significant changes in the screen driver section of the ROM BIOS. The keyboard layout is also quite different. Even so, it would still have been possible to retain the PC interrupt definitions. One can't help feeling that the Duet is a product of Japanese individuality rather than just sheer cussedness on the part of the designers.

The Duet-16 is powered by an 8086 running at 8MHz. The review unit included a high resolution RGB monitor, separate keyboard and system unit with two disk drives and 384K of memory. A socket is provided for an 8087 numeric coprocessor chip, and the rear panel of the system unit carries two RS232 serial ports, an auxiliary IEEE-488 serial port and a parallel port. An optional external expansion unit is



available with a 10M or 20M hard disk drive, connected to the system unit via a bus cable, and providing five expansion slots (alas, not for PC cards). Expansion to 640K is possible within the system unit. The basic system unit contains 128K of RAM, of which 32K is reserved for graphic video RAM. The additional 265K in the review unit is provided by two plug-in boards, however 64K of this is reserved for graphics.

Physically, the Duet-16 is quite small. The system unit is 40cm wide by 33cm deep and just 9cm high. It is housed in a square-cut beige plastic cover which can be easily removed. The keyboard is slightly larger than that of the IBM PC. The most striking feature of the Duet-16 is the screen resolution. After a cold boot with MS-DOS 2.11, the white lettering is crisp and well-defined. It's hard to accept that this is an RGB monitor after having had long experience with the regular RGB monitor of my PC. The DOS has been tailored to set the time and date automatically from the internal battery-backed calendar clock without resorting to the use of a timer utility. The familiar PC-DOS designations for the function keys are implemented somewhat differently using a special cursor control key.

The graphics resolution (in either monochrome or color) is 640 by 400 pixels. The color range depends upon how many additional memory cards are installed. With the bare minimum (no expansion cards), only two colors are supported. With two expansion cards (as in the review unit) one can display eight colors. Each of the primary colors (red, green and blue) are bit-mapped from the three separate video graphic RAMs. The architecture does not permit the use of an "intensity bit", which would otherwise double the number of displayable colors.

Under Microsoft BASICA, the SCREEN 1 command sets up the high resolution graphics screen, while SCREEN 2 displays the graphics page superimposed on the text mode page (from SCREEN 0). The images displayed in color graphics mode are as good as those of the NEC APC III. In text mode the character set corresponds to the IBM PC, except for control codes (those less than 20H) and codes greater than 7FH. That can be a nuisance, but not an insurmountable problem, for programmers converting PC software to the Duet.

The keyboard has excellent feel, keystrokes produce a quiet but effective audible beep, and the tilt angle is adjustable. There are LED indicators on two keycaps —the CapsLock and the CODE key. The latter key switches to an alternative character set (mainly foreign alphabets). The numeric keypad has no need to double up as a cursor control pad, as there are separate keys for this purpose, including a large eight-way key which you wobble in the direction required! The keyboard may be locked to prevent operation while unattended.

The half-height disk drives run at 96 tracks/inch and may be formatted for either 360K or 720K under MS-DOS. Unlike the APC III, the Duet-16 can write as well as read IBM PC diskettes. The technical manual refers to a reset switch on the rear of the system unit which I had trouble finding. It's behind a small hole, and you need something like a match to press it in. One can perform a warm boot by pressing the REQ key followed by a Control-CAN. A similar sequence (REQ Control-ENTER) invokes the ROM-based debugger which uses the top half of the screen.

Duet-16 documentation is first class. Each manual is handsomely bound in such a way that the binder can be used as a vertical book rest. Each is well written and indexed, in spite of an infrequent lapse into Jinglish. The MS-DOS manual explains the peculiarities of the system in excellent detail, then provides the user-oriented aspects of MS-DOS itself. The technical manual is excellent, but Panafacom is not prepared to divulge the source listing of their ROM BIOS code.

Software offerings include *dBase II, Multiplan, AutoCAD, WordStar 3.4, WordStar 2000, Turbo Pascal, PeachText* and *Brainstorm.* GSX utilities are also available, and accounting packages include *FBS, dBflex* and *Finax*. The 12-month warranty period on parts and labor is optionally extendable through Honeywell. There are approximately 16 SBC dealers in Australia, primarily concentrating on vertical markets. About 100 units have been sold in Australia since its introduction about 18 months ago.

SBC DUET-16

Australian Distributor
Computer Enterprises
Suite 60, Chatswood Village
47 Neridah Street
Chatswood NSW 2067

Basic Configuration

Processor:	8086	
Clock Speed:	8 MHz	
Total RAM:	96K (up to 640K onboard)	
Ports:	1 Parallel 2 Serial 1 RS-422	
Video outputs:	RGB or TTL monochrome	
Operating System:	MS-DOS 2.11	
Weight:	Main unit 10.6kg Keyboard 2.5kg Monitor 12kg	
RRP (inc. tax):	Monochrome 128K	$3600
	RGB 128K	$4050
	Additional 128K	$435
	Expansion (10M)	$3000

Benchmark speeds (IBM PC = 10)

CPU-bound	17.8
Disk-bound	13.9

Ratings 0 (very bad) to 5 (excellent)

Hardware Compatibility:	2.0
Software Compatibility:	2.5
Value for money:	2.5
Documentation:	4.5
Maintainability:	4.5

Best points: Screen quality, speed.
Minor gripes: Keyboard and screen connect to front of unit. Cold boot locks in uppercase mode.

Only NetComm could blend the functions of three modems into one.

Introducing the NetComm SmartModem® 1234.

It's another breakthrough from the fertile innovation of NetComm. The NetComm SmartModem 1234 is the first of a new range of modems to combine the multi-chip technologies needed to provide everyday low-speed operation with the super-fast requirements of major business demands, all in the one super-compact unit (it fits under your phone!)

The one modem now enables access to bulletin boards operating at 300 baud, Videotex services such as Telecom's Viatel at 1200/75 baud, as well as Packet Switching Networks including OTC's Midas and Telecom's Austpac at 1200 baud full duplex. In addition, the 2400 baud full duplex facility will enable high speed point to point file transfer, and access to data bases that will soon be upgrading to the new V22bis facility. This single, sophisticated modem supports auto-dial, auto-answer and auto-disconnect.

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So if your business is competitive enough to want to outsmart your rivals, you owe it to yourself to investigate the smartest modem on the market, at the smartest price. The NetComm SmartModem 1234.

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Minerva = 07:DNC002 Viatel = 288855330

NE12FPC

PC videotex ~

can it deliver?

Graphics-based information systems such as videotex have the potential to launch PCs into the twenty-first century — or is it PCs that will cause videotex to take off? Ian Robinson reports on the state of the art in PC videotex.

Australia's public videotex system, Viatel, is nearing the end of its first full year of operation and it would seem an appropriate time to reflect on what this brave new communications medium has (and has not) achieved.

One point which has become increasingly evident over the past few months and which will continue to dominate events in the future, is the key role PCs have played in the development of videotex as a serious business tool.

Videotex as it stands today is a far cry from the service initially envisaged. The developers of the Prestel system in Britain (of which Viatel is an unashamed clone), originally saw videotex as a very consumer-oriented service, whereby home users would link up decoder units to their telephones and color TV sets to get the latest sports results, grocery prices and weather reports. As it turned out, this idea never really caught on and the vast majority of people continued to watch sport on television, scour the newspaper for the shopping specials and gaze out of the window for an up-to-the-minute weather check.

However, videotex did explode in the business environment and the catalyst was the introduction of functional videotex decoding packages for personal computers. Business users have a much greater demand for timely external information than home users and are prepared to pay for it.

The advantages of PC-based videotex systems over home television decoders are immediately obvious — screen pages of information can be retrieved and stored on disk, manipulated and printed out as required, and common retrieval sequences can be easily automated with a little programming. But this is only scratching the surface. PCs can now be employed as flexible editing stations for videotex information screens, and some even function as full-blown host videotex systems! But perhaps I should backtrack a little, and describe more fully the technicalities of videotex and the all-important PC connection.

BBS versus videotex

Most PC users would have accessed or at least seen an electronic bulletin board system (BBS), whereby PCs are linked together by a modem.

Bulletin board systems, like telex, are textual in nature and suffer from this accordingly. By limiting transmissions to not much more than the standard ASCII character set, BBSs miss out on two of the key features of modern PCs, color and graphics. Furthermore, this situation is not likely to change in a hurry, because it is in these two areas that various manufacturers' microcomputers differ the most. Even the 'standard' IBM PC can be fitted with one of a dozen or more color/graphics boards.

Another disadvantage of PC-based BBSs is the fact that they are normally only accessible by a single phone line at a time, making them useless for time-critical information that multiple users may wish to access frequently. As a result, BBSs have proliferated on a communal level as a personal communications medium between relatively small like-minded groups of users, and their transmissions have been limited to monochromatic ASCII-based information such as messages and public domain software listings.

This is where videotex comes in. It is based on discrete 'pages' (or screens) of information, using color and limited graphics in addition to text. A mainframe-based videotex database can be accessed through the telephone network by many users simultaneously, is organised into a structured set of pages and arranged so that movement between pages is intuitive and simple, using a sensible menu selection system. The user only needs to use a numeric keypad in order to navigate through a videotex database, except where text entry is required as part of a message or product order.

This leads to another important feature of videotex — interactivity. Information can flow in both directions, so that transactions, such as electronic shopping, banking, and share manipulation, are possible because users of the service can send information back across the line to the host system, unlike television or radio. (Indeed, Robinson's First Law of Informatics states that the usefulness of any information service increases by an order of magnitude once it becomes bidirectional.)

How does it work?

Viatel is a public videotex system operated by a division of Telecom, as opposed to the many private and in-house systems, which exist mainly in the corporate sector. Organisations wishing to provide information on Viatel rent pages (usually in blocks of

50 for a monthly charge), which they design and structure as they see fit. Although users may be charged anything between one cent and $4.99 to view a page, the majority of pages cost nothing to examine. Page charges depend on the assumed value of the information, as determined by the particular 'service provider' (or SP, as Telecom refers to them).

Besides charging for page viewing, SP organisations can use Viatel to simply provide information as part of a selling strategy (as in airline timetables), directly sell products or services or use it as a virtual in-house information system. This last feature is achieved by declaring a 'closed user group' (CUG) in which only certain individuals can access particular pages.

Subscribing to Viatel involves filling out a form and paying a monthly subscription fee of $12.50 (or $2.50 for non-business users). For its first year of operation, however, (which ends on February 28) all users need only pay $12.50. Telecom decided to adopt this initial strategy to build up the Viatel user base, in order to attract further SPs. Besides the monthly page rental, Telecom charges SPs a further five per cent factoring fee of the revenue generated. This money is collected simply by adding the amount on to the end of the customer's telephone bill — which results in an extremely low incidence of bad debts when compared to other billing methods.

What do I need?

PC users intending to link into videotex systems need to obtain the appropriate hardware and software, as well as a subscription and password for the particular videotex system. The hardware required is a modem capable of the 1200/75 baud videotex rate. This means that the image data feeds into the PC at 1200 baud (bits per second), whereas the user's keystrokes are fed back at only 75 baud. Fortunately, most videotex

What do all these magazines hav
THE AUSTRALIAN SOFTWARE GUIDE
1984's Top 300 Packages From 100 Companies In 15 major groupings
your computer
SOFTWARE SHOOTOUT
MONTHLY TODAY'S COMPUTERS
BUYERS GUIDE
·Maintenance, yes or no?
·Modems for business
Win a $5000 Ericsson PC
Mergers – avoid the computer blues
Using the Macintosh in field audits
BUSINESS
EXCLUSIVE THE MAN SHAPING YOUR TAX FUTURE

They all applaud Framework.

"In summary, Framework is an impressive product, and pleasing to use. It allows you to create, modify, organise and analyse information and to present it in a professional way. Its strengths lie in its text management, its ease of use, and the way it allows you to organise inter-related information.
AUSTRALIAN SOFTWARE GUIDE OCT 84.

Framework seems to have no particular bias to one work orientation or another; that is, it's not a spreadsheet with added-on features, nor is it a database with a spreadsheet tacked on. Overall, it seems to be fairly strong in both data management and word processing, and is a strong all-round performer.
YOUR COMPUTER DEC 84.

Framework is an excellent all-round product with few weaknesses. It offers true integration and tremendous versatility.
If you are looking for a good, flexible, all-round package, then it is hard to go past this one.
TODAY'S COMPUTERS MAY 85

Framework enables users to "think on the run," to formulate disparate ideas and then arrange them logically. The program uses logical steps or "frames." A frame can be a single word or number, a paragraph of text, a complex unit of information, or a completed spreadsheet. Framework is an excellent program.
AUSTRALIAN BUSINESS APRIL 3, 1985.

databases are structured so that the user needs to employ minimum keystrokes to get around.

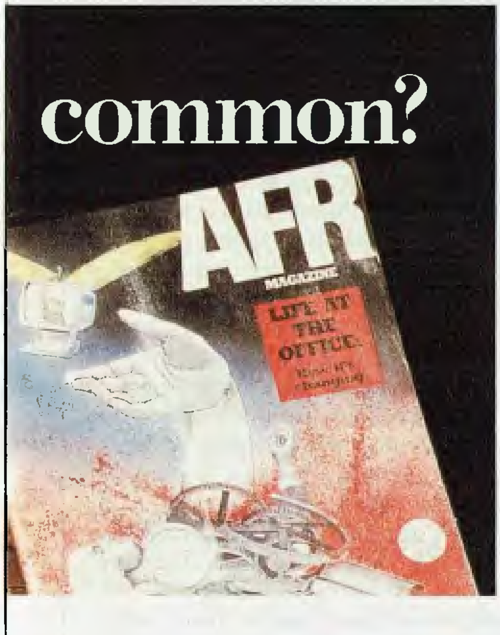
Several videotex modems are available for the IBM PC and compatibles, and most of these either come bundled with videotex software, or offer this as an option. Only two internal modems have so far been approved by Telecom — the NetComm In/Modem and the Sendata Data Express. These take the form of short expansion cards which plug into any available PC expansion slot. External modems, on the other hand, require a standard serial port and cable to connect to the PC. There are a multitude of 1200/75 external modems available although, like PC compatibles, these are often the same device with a different label. The same can be said for many videotex software packages, and a careful study of the various offerings will reveal that there are really just three or four different programs disguised in dozens of different names. Independently developed videotex software is widely available as a separate item (at varying prices), and there are even rumors of some public domain material about to trickle through the pipeline.

Now for the bad news. The standard PC Color Graphics Adapter cannot handle the eight videotex colors at the appropriate medium resolution required by videotex. The only way to obtain a full-color videotex display is to either modify the display adapter hardware or get a higher-powered board (such as IBM's Enhanced Graphics Adapter). This problem has been tackled in varying ways by the different manufacturers of PC videotex hardware and software, from the monochrome-only approach used by VIP (supplied with the Data Express), to the four-color shaded approach used by the NetComm software, to the replacement CGA ROM provided with Rank Electronics' Xyllyx package. The best solution will probably end up being the inclusion of a number of device drivers in each package, to suit the various (incompatible!) high-resolution graphics boards available. This approach is widely used by word processing packages to cope with the various incompatible printers on the market.

So how do I hook in?

Fortunately, connecting into Viatel (or any other videotex system) is relatively simple compared to the decision-making required to get the correct hardware and software package for your PC. All you do is dial the Viatel number (01955) and let your software do the rest. If you have

common?



Framework offers windowing so that the integrated word processing, spreadsheet, graphics, database management and communications can be displayed on the screen simultaneously. There is a common command set for all applications and a frames editor for applications development. ”

AFR MAGAZINE SEPT 4, 1985.

Framework is now even better.

Framework II contains a larger, faster and more powerful spreadsheet.
It includes an advanced word processor with 80,000 word speller checker, visible page breaks and built-in mailmerge.
These two primary functions are supported by fully-integrated telecommunications, database, outlining and colour graphics.
In fact, all the features are tightly integrated with common syntax and keystrokes, eg. the spelling checker works on spreadsheets as simply as it does on text.
Framework II works on the IBM PC, XT, AT or close compatibles, It can take advantage of memory sizes greater than 640K.
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an auto-dialling modem, then you don't even have to dial the number!

Once connection has been established, the Viatel sign-on screen appears, at which stage you enter your personal user number and password. After these have been verified you are presented with Viatel's main menu, and the option to examine new additions to the Viatel database. As most private videotex systems are closely related to the Viatel/Prestel protocol, using these is a very similar operation.

The crude, chunky Viatel graphics are not all that inspiring when discovered for the first time, but like the letters on the PC color display, you soon get accustomed to the pain. In fact it is amazing what some of the videotex screen design artists have managed to achieve with a meagre 40 characters by 22 line display. Each character cell can be divided into six 'pixels' to obtain the medium-resolution videotex graphics, and double-height lines, altered backgrounds and flashing characters are also supported, albeit in a rather primitive way. Well, what else could you expect from a system designed more than ten years ago?

The bottom line

So what can you, the PC user, hope to achieve from an information system that, while an improvement on monochromatic text-based systems, is neither "spritely" nor sprightly in its delivery? To begin with, there is a greater range of services available on Viatel than on any other similar system, and the number of service providers is growing weekly. Most of the major airlines, financial institutions and government organisations provide information on Viatel, and once a company in any particular industry gets itself onto Viatel, it does not take long for its competitors to jump onto the bandwagon.

Daily news headlines can be viewed on Viatel, as can nationwide weather reports, commodity and share prices, currency exchange rates, and CPI figures. This information is dynamic — that is it may change several times each day as the SPs update their pages, ensuring that videotex users get up-to-the-minute data. The interactive sections are even more interesting, and make use of a videotex feature known as 'response frames', where users fill in a pre-formatted screen to order products, answer surveys, or otherwise respond to the system. This is how the telebanking and teleshopping services operate.

If a PC user is involved in a business where certain videotex pages are scanned or otherwise manipulated each day, it is possible to fully automate the procedure through software. For example, a PC system could be set up to dial into a videotex database at a certain time each day (or hour), retrieve specific page data (such as share prices), merge this into a database file and manipulate it in some way — automatically! The potential for this type of operation is immense, although it has hardly been exploited so far. Several companies offer a programming service where this type of videotex scanning activity can be set up for a fee.

The icing on the cake

One feature which popularised the original British Prestel system with an army of microcomputer users was telesoftware. This is basically a method where software is disguised as frame data on the videotex host, and then converted back into the real thing when received by the microcomputer. As Prestel basically worked around the ASCII character set (all graphics and special functions are preceded by an escape character), it was not conducive to transmitting binary code directly, so that programs had to be encoded into pseudo-frame form and then decoded again. The standard devised was a 'quick and dirty' patch, but it did the job and it has survived to this day as a 'official' Prestel telesoftware standard.

Although this standard exists, little use has been made of it in Australia so far, and in fact far more extensive and useful collections of PC software may still be found on the many bulletin board systems which operate around the country around the clock. Unfortunately, most of the telesoftware currently available on Viatel is fairly trivial and, to add insult to injury, it costs money to download. The gems available on the various BBSs are high quality programs, regularly updated and cost nothing but the telephone time.

Nevertheless Viatel is still in its infancy and, perhaps as time goes by, more useful public domain (i.e. free) software will begin to appear on its pages. It will take a long time before the public domain spirit, which currently pervades BBSs and PC user group meetings, seeps through to Viatel, but we can only live in hope.

Perhaps as PC-based host videotex systems (such as PC-Display, which emulates Prestel), decrease in price, these may spring up around the country as viable alternatives to BBSs. In any case, the net result is that more PC owners will be purchasing videotex hardware and software over the coming months, which will lead to an eventual reduction in prices as volumes are increased, causing more PC owners to buy the equipment, and so on. In fact, the demand for videotex capability may become a leading reason for the purchase of future PCs. Only then will videotex really be in a position to become a truly dominant business communications medium. ■

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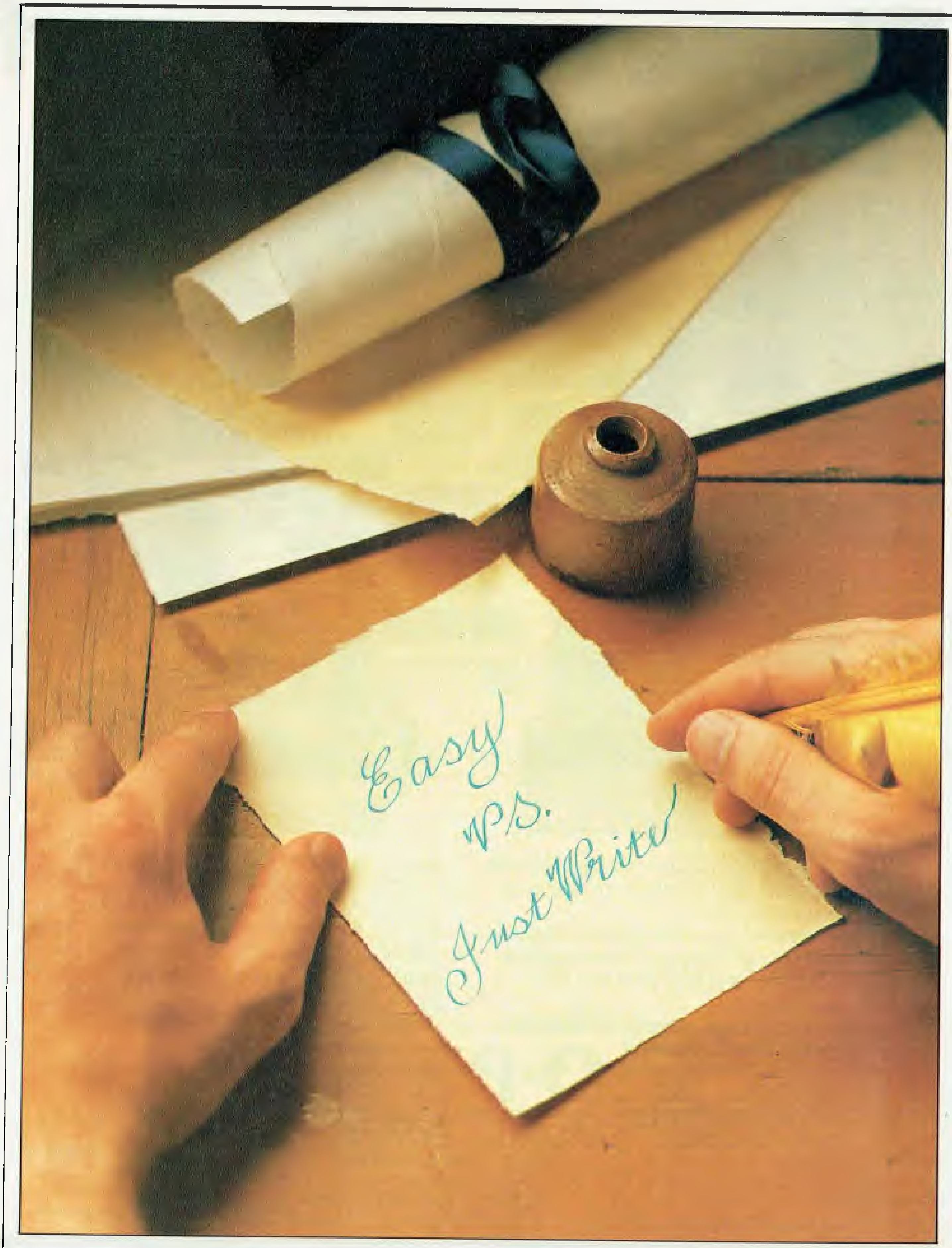

Easy
vs.
Just Write

Economy of words

The two leaders in the PC word processing stakes have released stripped-down versions of their products, supposedly targeted at the occasional word processor user. Les Stein explores whether this low-cost low-functionality software really has a place in the market.

Just when we thought that the computer industry had buried the novice in an avalanche of complexity, Micropro and Multimate have thrown out a lifeline. In a market stuffed with huge RAM boards, artificial intelligence innovations, accelerator devices and new forms of networking they are promising shelter from the storm.

But is there really a market out there for programs with training wheels? There is already a glut of low-end word processing packages. *Textra* costs $9.95 in the US, *PC-Write* is free, *PFS:Write* has been around for years and *Personal WordPerfect* is as easy as you can get. Managers who hunt and peck can get by with one of these or half a dozen full-featured but friendly products such as *VolksWriter*, *DisplayWrite* or *Microsoft Word.*

Micropro International and Multimate Corp. (recently acquired by Ashton-Tate) must believe that there is a substantial group of word processing dilettantes who require an idiot-proof system for small reports or letters. Both Micropro's *Easy* and Multimate's *Just Write* also presume that these infrequent users will never grow up, as the commands of *Easy* have no resemblance to *WordStar* and *Just Write* files cannot be read by *Multimate.*

What is 'ease of use'?

Every program claims to be easy to use. Most of them are, after you get to know them. In the meantime, you must plough through rocky fields strewn with poorly-written documentation, cryptic messages, confusing screen displays and random commands which have bubbled up from a programmer's muddled head.

Certain basic standards seem appropriate before the phrase "ease of use" can be applied.

The installation process must be full of prescient error-trapping for those who jump before they think. A case in point: when I received *Just Write* the machine was on and DOS loaded so I just stuck in the master disk, rather than making and using a working copy. "Unknown Error" appeared. I took the disk out, put back my DOS disk to do something else and found to my horror that the directory had been mysteriously overwritten with that of *Just Write.* When I called Multimate they told me that strange things can occur when you do not follow instructions and that the master disk should never be used. Nothing like being punished without warning to remove any confidence in a program.

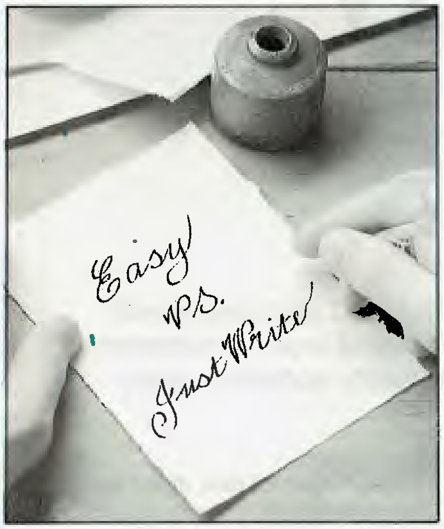
Easy of use implies no jargon; not only an absence of technical terms such as "microjustification" or "memory-resident" but the presence of common English expressions that do not assume prior knowledge. Micropro's *Easy* talks about "files" without explanation. They make an improper assumption that this term is universally understood in this context. *Just Write* uses the more descriptive "document".

The notion of ease of use is countermanded if the manual is even slightly vague. The *Just Write* manual explains: "On a word processor, there is no such thing as a blank space. That is, a blank on a screen is interpreted by a computer and *Just Write* has a special space character (although it does not appear on the screen)." What useless and confusing information to hand to a novice!

Help screens, the essential beginners' device, cannot merely be splashed on a screen brimming over with information, but must conform to a high standard of clarity. *Just Write* has only one help screen which displays all commands in one hit with no further explanation as to their function or usage. This immediately makes suspect any claim of simplicity. *Easy*, on the other hand, presents a separate help box for each command although some are a bit too crammed with information.

To separate the wheat from the chaff, ease of use must mean something more than menus, help screens and a tutorial disk. True ease of use demands a design which is so clear that it is always apparent what is taking place on the screen and what to do next. It is no good if you have to cast around on the screen or in the manual for some guidance. Let's face it, if the next step is not readily apparent then it may not be hard to use but it cannot be said to be easy.

The foundation for ease of use is a consistent design philosophy. It is not



sufficient if features can be used with a minimum of keystrokes or are mnemonic. Each must be part of a unified design so they are not viewed as separate independent functions but rather as flowing from one consistent rationale.

The design of Easy

Easy could not be much easier. Micropro has devised a design that is very obvious and clear. The main menu leads to a screen with a ruler line and three messages: F1 = Help, F2 = Menus, Esc = Get Out. F2 opens the first menu of commands; pressing F2 again moves to a second set. There are no other commands and no other function keys. Help (F1) will provide an explanation of the command highlighted.

The options are not split between the two menus according to a clear system. Menu 1 contains most of the text manipulation devices such as move, copy and delete, the enhancement facilities of boldface and underline and also the Save command. Menu 2 contains other manipulation and enhancement commands such as centring and sub- or superscripts as well as file insert and spelling. The second menu also contains the formatting commands. There is no simple way to recall what is where and, since only one menu can be on screen at a time, it often takes a short search to find what you want.

Since all the commands are located in menus, the design and operation of the program would be obvious to an intermittent user. There can never be much doubt where to look to execute a command. The cost of this menu system is often a higher number of keystrokes than a command driven arrangement. If a command mode were added the program would appeal to a wider market. MicroPro is to be commended for sticking to the one design goal and not trying to be universally accepted by all segments of the market.

There is one deviation from the simple design in the use of dot commands for formatting. Micropro moved away from reliance on these codes in *WordStar 2000* and I was surprised to see them re-emerge in this, the most simple of the company's products. Micropro could, perhaps, have lumped them into a separate menu. Although the purpose of dot commands is briefly explained in the manual, no examples are given of how they should be used or what results they will produce.

Operation of Easy

It may be necessary to press F2 twice to get to the right menu. A task is then chosen by either moving the inverse bar to an option and pressing Return or just pressing the first letter of the command. *Easy* has some success at guessing what command should be next. As an example, if you change line spacing, the next time you call up a menu the paragraph reform command will be highlighted.

There is a strange absence of assumptions when it comes to carrying out a task. To underline a word, for instance, you are first asked to move the cursor to the starting place and then press Return. Most programs assume that the start is where the cursor presently lies. Perhaps this is a useful check for a beginner but it results in an excessive number of keystrokes. To underline a word you first have to press F2 either once or twice to find the right menu, then choose the underline option, press return to indicate the start of the underline, move to the end of the text to be underlined and finally press the return key to complete the task.

Cursor movement is reasonably straightforward. The control key is pressed into service for longer jumps and it would probably be necessary for the occasional user to refer to a keyboard "map" which is provided. I was disappointed that Home and End do not take the cursor to the beginning and end of a line. Instead, these keys regulate the less frequent movement to the beginning and end of screen.

Easy offers different fonts and type styles. The manual contains conflicting information on the difference between a font and a style. A style includes colors and italics while a font may include colors but is meant to correspond to pitch. It would be close to impossible for a new user to figure out font and style commands. To its credit, *Easy* works with just about any printer known, including the new laser printers.

A spelling checker is nicely integrated into the program. The dictionary contains 65,000 words and a personal dictionary will take an additional (unspecified) number of words. The checker presents suggestions in a clear screen display and there is never any doubt as to what to do next.

Just one problem

Samna Word III was written in BASIC and had the annoying problem of being unable to capture and display the keystrokes of a reasonably fast typist as they were entered. *Easy* was written using Modula 2, but has the same problem. In the case of *Easy*, this is not a fault of the programming language but rather some poor techniques of keyboard response. When new text is inserted within existing text, even a slow, one finger typist will watch the screen update lag behind keystrokes.

A fast typist will utterly despair during the normal entry of text. The program simply cannot keep up. This is compounded by the program constantly going out to disk each time a command is chosen or executed. It occurred to me that Micropro may have deliberately slowed down the program to restrict it to users who are strangers to a keyboard. A more likely explanation is that this is a substantial defect which should have been corrected before the program was distributed.

The design of Just Write

The first impression of this Multimate product is that it is a command-heavy word processor no different to any other. Commands are executed by use of function keys in in their normal and Alt state, There are some mnemonic codes, but generally it is necessary to call up the single help screen, browse through the Quick Reference Card or the provided "keyboard layout", which is a piece of cardboard too large to rest on the keyboard ledge.

Just Write is essentially a subset of *Multimate*, which in turn is modelled on the popular Wang word processors. The screen layout looks more or less the same and the main menu options are adumbrated versions of the parent. You either like Wang word processing or you don't. or you don't.

Multimate always fell short of true Wang word processing because it lacked a dedicated keyboard. Commands were spread all over the PC keys and it took many weeks before you could be comfortable with the product. *Multimate* now offers its own dedicated keyboard and has had a large measure of success in a cluttered marketplace. Without a dedicated keyboard or a function key template, *Just Write* commands are as hard to remember as those in *Multimate*, but there are less of them. *Write* can only be derived from the fact that this is a scaled-down version. It cannot be said to have any unified design when you come across such meaningless key assignments as F3 for the centre key and Alt F3 for line spacing. There is no system that makes this product as compact and design-efficient as *Easy*.

Operation of Just Write

The manual is somewhat wordy but will lead a patient user into entering and manipulating text. The copying and movement of marked text and the control of margins is consistent with the Wang model, which has always been the best in this respect.

The payoff of using function keys and some mnemonic commands is the faster execution of tasks than *Easy*. *Just Write* has the feel of a top-of-the-line product when it comes to text entry. Unfortunately, *Multimate* chose

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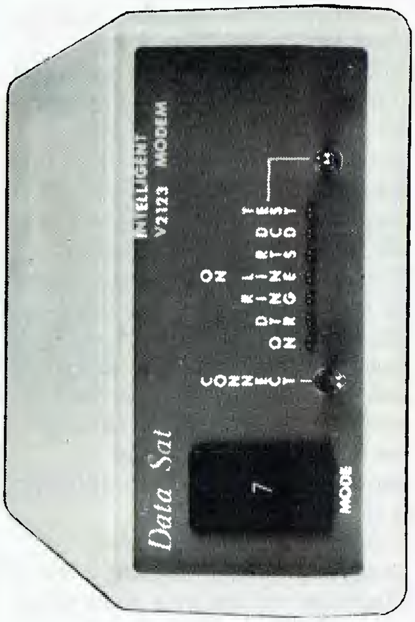

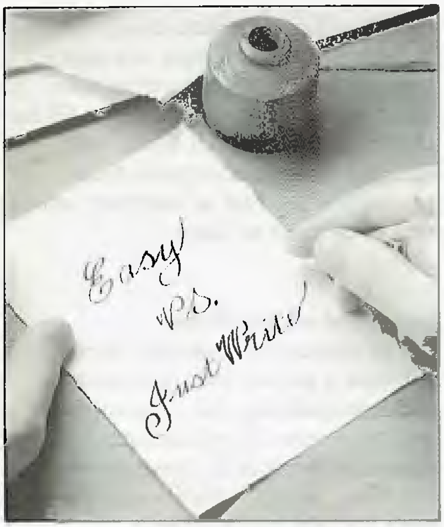

to retain its dreadful system of page orientation. A document in *Just Write* is treated as a bundle of individual pages. You cannot view the end of one page and the beginning of another at the same time. You are either on one page or another. The advantage is that each page is stored to disk when it is completed. The disadvantage is that there is an unconscionable wait for the next page to appear.

Some cursor movements require a bit of deduction. There is no movement to the end of a document except the indirect method of using the Go to Page command and specifying a page number larger than the document contains. Alt L will move you to the beginning or end of a line but only after you specify a direction using Control right arrow for forward and Control left for back. The same awkward system applies to movement by sentence or paragraph and, unfortunately to movement by word. The manual states, although not in the section on cursor movement, that Shift-Tab will jump to the beginning of a line.

Just Write has a very good footnoting system. Marking a spot for a footnote will call up a blank screen on which to enter the reference. A touch of key will return to the text. Micropro suggests that students are part of the likely market for *Easy* but the program does not contain any footnote capacity. The *Just Write* footnote scheme is almost comparable with the best PC word processing programs.

While *Easy* can insert another file into a document, *Just Write* allows the storage and recall of boilerplates in what is called a "Phrase Document". Each individual entry is stored on a separate page in that "Document" and there can be up to eight pages in total. Each phrase is chosen by a number, but without any access to a description of what is inside. The manual suggests that it is a good idea to keep a list of the contents of each page. I could not discover how to delete individual pages or substitute one for another.

When you register your purchase, Multimate provides a new disk containing a spelling checker. It can check a word or a page at a time with a dictionary of unspecified size and a personal vocabulary created by new words not understood during a session. *Just Write* supports only six common printer types. There is a pitch selection menu but I could discover no method of controlling such attributes as italics or colors.

Easy or Just Write?

Just Write is missing some features found in *Easy*. No headers, footers, sub-or superscripts, no proportional spacing, decimal tabs or undo function. On the other hand, *Easy* lacks case-specific search and replace, boilerplate insertion, footnotes or movement by paragraph, sentence or Go to Page.

Both programs lack features found in full word processing products. There is no mailmerge, hyphenation help, math, sorting, column manipulation, widow and orphan control, macros, split screen, simultaneous printing and editing or print queuing. There are no style sheets or complex formatting devices.

These programs are concerned with ease of use and not quantity of features. Neither is suited to a writer or secretary or to a small business where word processing is a constant activity. *Just Write* but not *Easy* could suit moderate use although it would be low on my list of possible purchases. If you want a Wang-like system for intermittent word processing needs, *OfficeWriter* is superior in design and execution to *Just Write*.

Easy is by far the better of the two packages for the target market of infrequent or novice users. It is a breeze to learn and operate. The design is consistent and, with the exception of dot commands, places no real demands on the user. The only other qualification is that the slow shuffling and display of characters restricts the program to very slow typists who show no sign of speeding up.

Just Write may find its place in companies which have been using *Multimate*, which has been well supported in Australia with quality distributors who offer seminars and technical advice. Micropro has been infamous for bad customer service in the US and it is not easy to get help for *WordStar* products locally. event and it will probably make little dent outside *Multimate* adherents.

If you can put up with painfully slow screen updating of keystrokes and a lot of disk access, then *Easy* is the best of the simple PC word processing packages available. It is even smoother to use than *Bank Street Writer*. It has the feel of a business program and would not look humiliating on the PC of a company nabob once past the opening banner display of its title. Micropro has truly created a new type of program which is as simple as could ever be imagined. ■

Easy $240
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Rosebery NSW 2XXX
(02) 662 4499

Just Write $225
Software Corporation of Australia
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Resident spellers

Computer inventions settle on the world like dust. All of a sudden a new idea is everywhere and competitors spring up overnight. The idea in this case is a spelling checker that examines each work as you type and instantly informs you of an error. There are already half a dozen advertisement for such products but three stand out.

Resident Speller is the product of S&K Technology, a family business in San Antonio, Texas. The program loads into memory underneath your favorite word processor and can be turned on for use by a simple command. It lurks in the background and does not impede rapid text entry. The moment it detects a space or a hard carriage return, which indicates the end of a word, it checks the word for spelling errors. It uses a super-compressed dictionary containing word roots and acceptable prefixes and suffixes.

If it finds a spelling error it beeps. There is no explanation of what is misspelled or whether it is a word it did not understand. There is no way to obtain a proper spelling from the program or scan its dictionary. I quickly lost interest in a scolding without explanation. A mere beep leaves you no wiser about your spelling.

The computer also has a separate conventional spelling checker which analyses a finished document. Perhaps the resident speller should be seen as a first line of defence for obvious typos as you speed along, and the separate final checker adds the finishes touches. The separate checker is not of the same quality as *The Word Plus*, *WordProof* or *CorrectStar*, my current favorites. As a mediocre speller, I did not like a succession of beeps without explanation. If you generally have no problem with correct spelling, *Resident Speller* may be a useful watchdog.

AI:Typist is a complete system of a resident spelling checker with a word processor. The speller cannot be used with other word processors so you must abandon your own faithful program, which I suspect will limit sales severely.

Spelling errors are highlighted in the text, but as with *Resident Speller* there is no way to check the nature of the mistake. You can turn off the as-you-type checking and proof the document when it is finished, but once again detected errors are merely highlighted without explanation. The manual suggests, "If you aren't sure what the correct spelling is, look up the word in a spelling dictionary."

The word processor is controlled by a series of function key options at the bottom of the screen. One option will present further options and there is only occasional doubt as to what keys to press to execute a command. The word processing is not as elegant or as simple as *Easy* but has a better interface for the beginner or middleweight user than *Just Write*. There will be help screens but these were not working in my beta test version.

AI:Typist would not be my choice of a word processor as it lacks features I will not do without, such as cursor movement by word. I also found myself a bit lost in the menu system, described in the manual as "kind of like Dungeons and Dragons". For the price, it is good value if you are looking for simple word processor with on-the-spot spelling control.

Turbo Lightning by Borland looks to be a very hot product for the low price of $99 in the US. I viewed a demo of a beta version but the complete program should be in Australia by the time you read this.

As you type into your word processing program, *Turbo Lightning* (codenamed "Rambo" during development) checks your spelling and beeps when an error is found. Unlike *Resident Speller* or *AI:Typist*, the touch of a key displays a list of suggestions drawn from the Random House Dictionary. The checker looks for literal and soundex matches and at another touch of a key the correct word can replace the misspelled one in the text or an unknown one can be added to an auxiliary dictionary.

That's not all. Another touch of a key calls on the Random House Thesaurus and displays a list of synonyms for the word indicated. The Random House Thesaurus has been available as a resident program as far back as the halcyon CP/M days. In combination with a fast resident spelling program the package becomes an indispensable writer's tool.

Borland, developer of such gems as *Turbo Pascal* and *Sidekick*, has promised that *Turbo Lightning* will also have a resident encyclopedia available soon. Still not enough? The Turbo Lightning Library is in the works with a large array of reference books for on-line reference.

Borland's *Turbo Lightning* package is an exciting new milestone in computer innovation. What possibly could come next? Maybe this: Businessoft of Annapolis in the US, has announced *MindReader*, which anticipates the word to be typed after a few letters are entered and finishes it for you.

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San Antonio, Texas 78249

AI:Typist $US69.95
Airius
11830 S.W. Kerr Parkway
Lake Oswego, Oregon 97034

Turbo Lightning $US99
PC Extras
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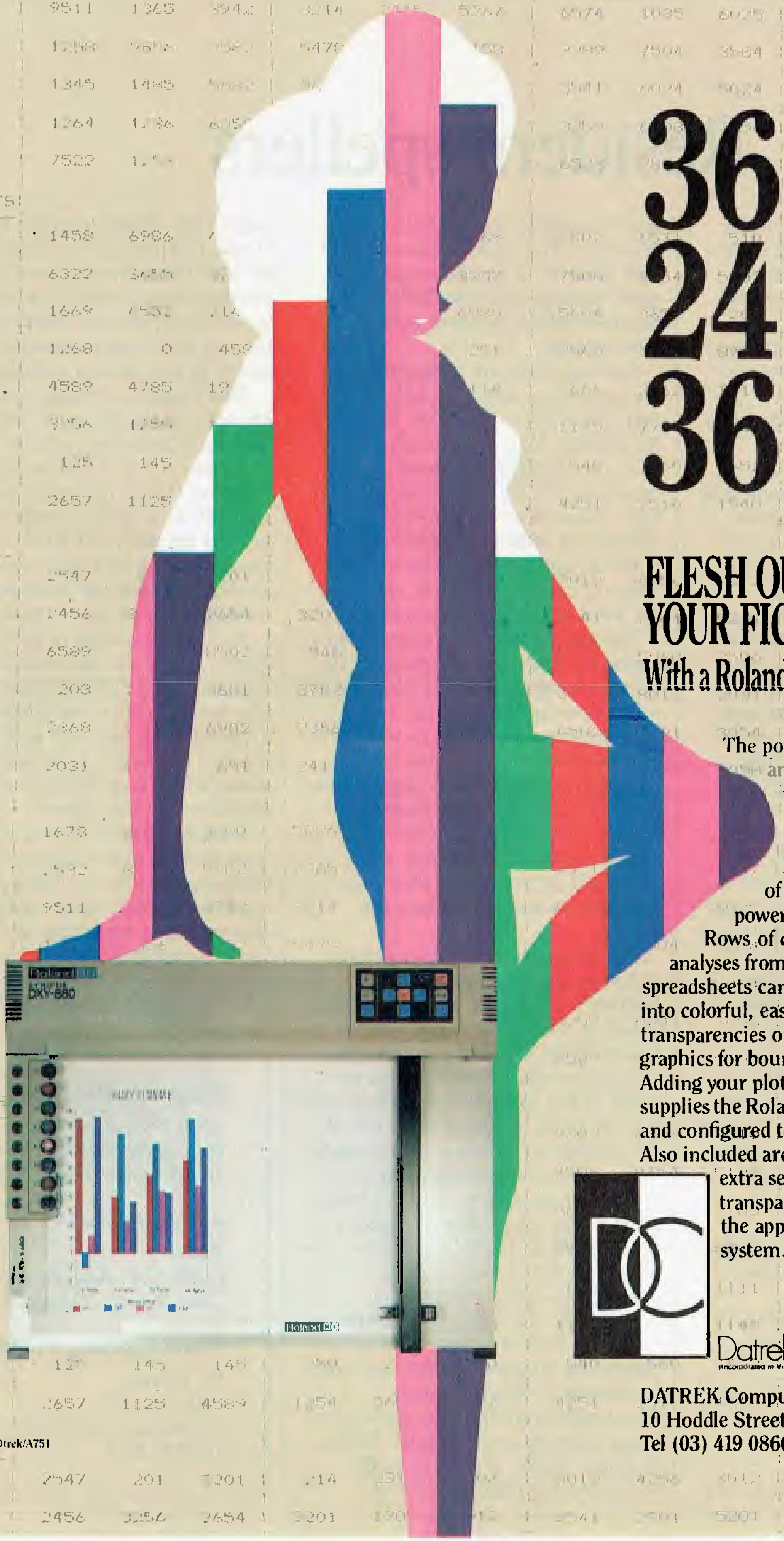

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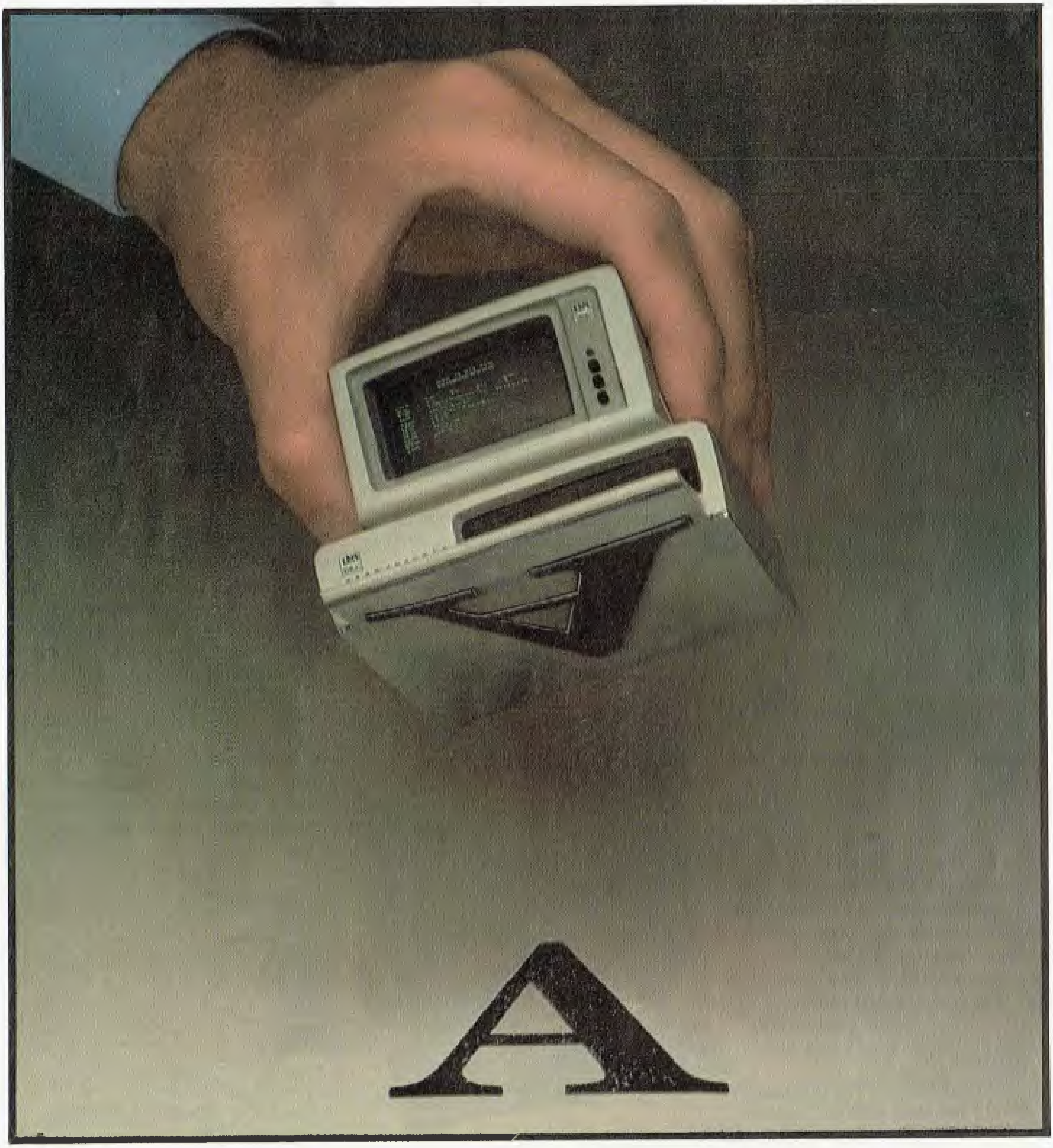


Downloading character fonts

Many PC printers support downloaded character fonts, although this is often difficult to set up, as no established standard exists. John Walkenbach describes a BASIC program to make use of this feature.

Tired of seeing the same old characters on your dot matrix printer? If so, there may be an easy and inexpensive solution. Many of the newer dot matrix printers will download character sets, allowing you to redefine any of the standard characters into whatever dot configuration you choose. You could, for example, define the standard copyright symbol to print in place of the @ sign or print your company logo in place of the asterisk. And if you're really ambitious, you can create an entirely new typeface.

Not all dot matrix printers have the capacity to download new characters, In fact, the majority don't. A printer that allows downloadable characters must have memory to store character definitions. New definitions are stored in the printer's random access memory (RAM), and may be selected or deselected with a simple command sequence.

Many owners of printers with downloading capability ignore this feature either because they don't know about it or because it seems too complicated. Unfortunately, downloading is not given much attention in most printer manuals, and it looks more complicated than it really is.

And, as is usually the case for printers there is no standardization. Every printer that is capable of downloading does it in a slightly different way. They use different dot matrix sizes, different methods of defining the dot patterns and different commands.

Some popular printers that allow downloading of character sets include Star Micronic's Gemini-10X/15X and Delta 10/15, Epson's FX-80/100, and most Okidata printers, including the Microline 92/93.

Why Download?

Most dot matrix printers with downloading capability include several built-in typefaces or fonts. For example, you can usually select a standard character set, italics, or one of several foreign language character sets. Each of these fonts may be printed in different sizes — pica, elite, condensed, or enlarged. The result is a tremendous variety of styles and sizes, suitable for many different needs.

But you may not be satisfied with your printer's built-in character sets and type styles. A downloading capability opens the door to new

printing styles, letting you create custom typefaces or special symbols that may be useful for printing technical material.

Each profession has its own symbols, and downloading lets you intermix them with normal text when printing. To do this, you simply download the standard character set and then subsitute special symbols for rarely used built-in characters — for example, the tilde sign (~) or backslash ( ). Although the built-in characters will appear on the screen, they will print in the new dot configuration.

There are other methods of printing different characters. Specialized typeface programs such as **Fancy Font** and **Type Face** use the graphics mode of the printer to produce a wide variety of typefaces and sizes. These programs allow you to print elaborate characters in a wide range of sizes, but they use more memory, and the output is very slow.

Downloaded characters, on the other hand, will print at your printer's normal speed, and the only extra memory required is your printer's RAM. One drawback is that downloaded characters have a very limited resolution, so the characters you create can't be very complex.

How Downloading Is Done

Although the basic concepts are similar, printers use different methods of getting and storing new character definitions. The examples provided here are based on Star Micronic's Gemini-10X/15X printers. (See sidebar, "The Lowdown on Three Printers," for a comparison with Epson's FX-80/100 and Okidata's Microline 92/93 printers.)

When you send information to your

Continued page 42

Three downloading formats

If you have ever used more than one vendor's printer, you have probably noticed a simple fact: there are no standards for printers. Each printer has different characteristics and capabilities. Different makes of printer also use different escape sequences — the means by which software tells the printer what to do. So it is not surprising that printers differ in the way they handle downloaded characters.

Most printers that permit new character sets to be downloaded have escape sequences to perform this function. Usually the escape sequences vary from printer to printer. Printers also differ in the size of their characters (that is, the number of dots in each character horizontally and vertically) and how they code the dots.

I have compared three popular dot matrix printers (Epson FX-80/100, Star Gemini-10X/15X, and Okidata Microline 92/93) in the areas of matrix size, dot coding, and escape sequences to show how different these downloading features can be.

Matrix size is the number of dots, horizontal and vertical, that comprise a character. When designing characters to be downloaded, you can use only a limited number of columns for a character. This number is almost always the same number of columns that a regular character uses and varies from printer to printer. In addition, no two horizontal dots may be immediately adjacent. The Star Gemini's character size is 7×9 dots, the FX-80's is 8×11 dots, and the Microline's size is 7×11 dots.

Printers also differ in the manner in which they assign the codes for the

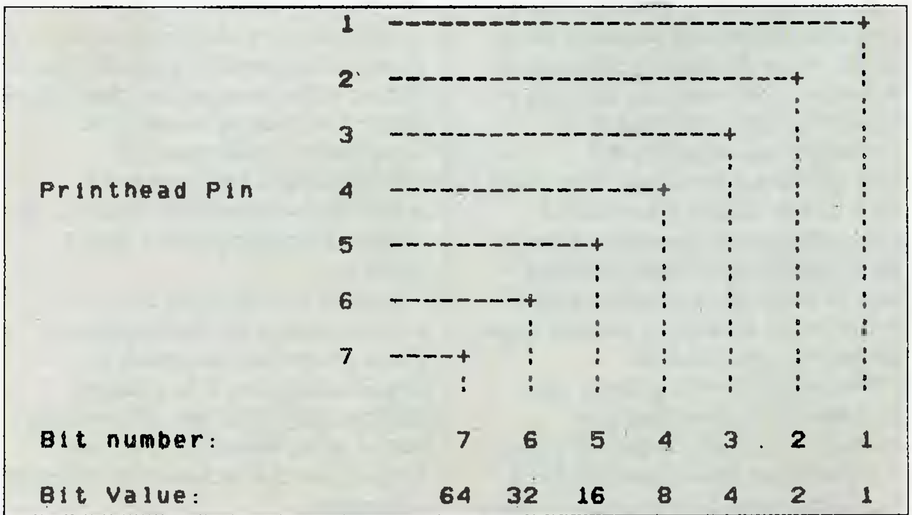


Figure A: A map of how the Star Gemini-10X/15X and the Okidata Microline 92/93 translate the printhead pin pattern into row positions.

dot patterns. A code for a particular downloaded character consists of a series of numbers, each number corresponding to the dot pattern for a column. For example, the FX-80 and the Microline both require 11 numbers to define a character (one for each column of dots). The Gemini, which prints with less resolution, requires only nine numbers for definition.

The numbers that you supply in your character definitions are simple decimal translations of the binary pattern of the pins on the printhead. Again, not all printers translate this pattern in the same way. For example, the FX-80 considers the upper pin to be the most significant bit — it uses the opposite method from that of the Gemini and Microline. The Gemini and Microline printers translate the values into row positions as in Figure A. But the FX-80 uses just the opposite translation, as you can see in Figure B.

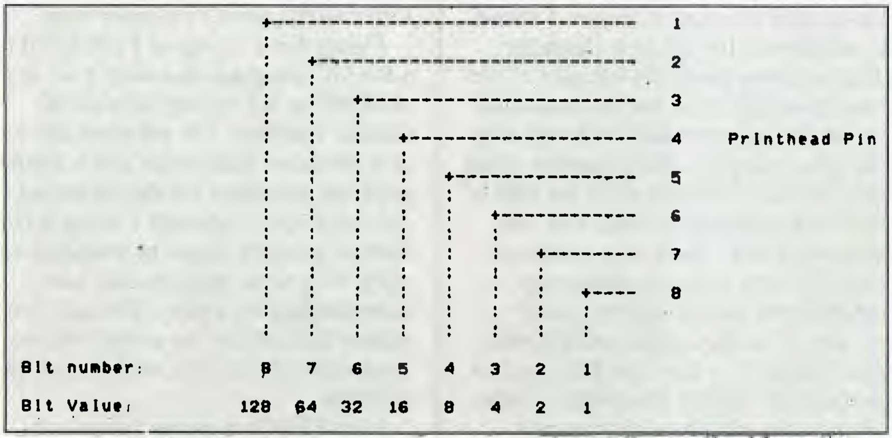
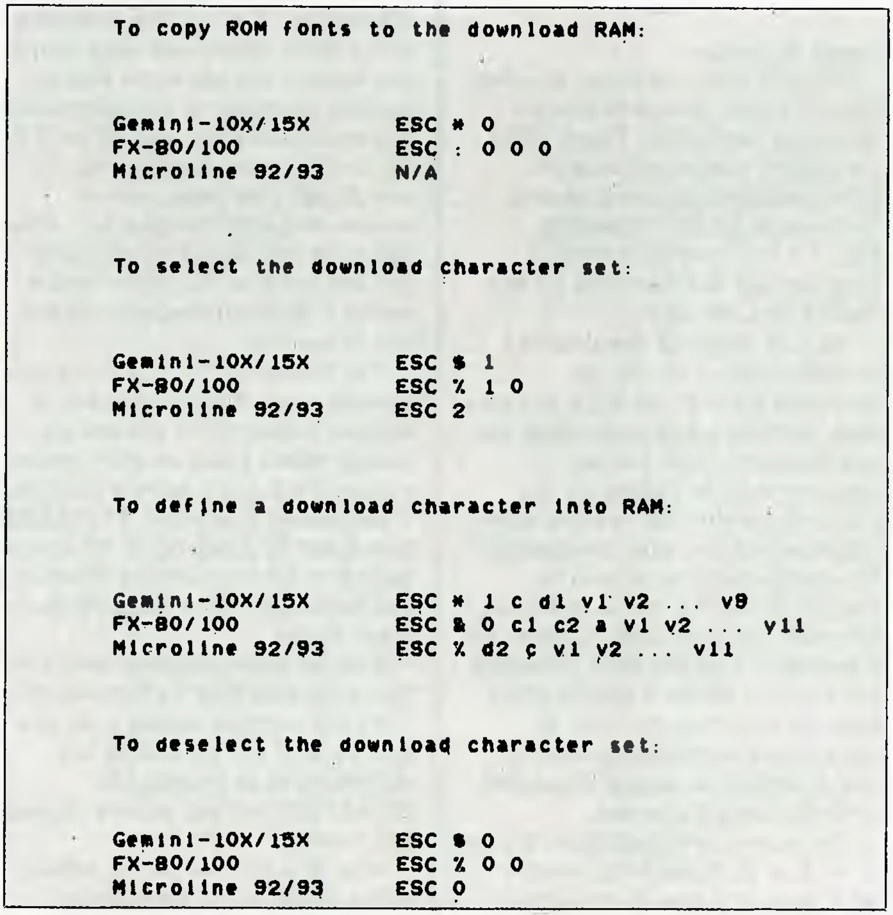


Figure B: The Epson FX-80/100 uses an opposite translation method from the one used by the two other printers shown in Figure A.



```
To copy ROM fonts to the download RAM:

Gemini-10X/15X        ESC * 0
FX-80/100             ESC : 0 0 0
Microline 92/93       N/A

To select the download character set:

Gemini-10X/15X        ESC $ 1
FX-80/100             ESC % 1 0
Microline 92/93       ESC 2

To define a download character into RAM:

Gemini-10X/15X        ESC * 1 c d1 v1 v2 ... v8
FX-80/100             ESC & 0 c1 c2 a v1 v2 ... v11
Microline 92/93       ESC % d2 c v1 v2 ... v11

To deselect the download character set:

Gemini-10X/15X        ESC $ 0
FX-80/100             ESC % 0 0
Microline 92/93       ESC 0
```

Figure C: A summary of the escape sequences for three popular dot matrix printers.

Obviously, column values will be the same for the Gemini and Microline. But since they have a different number of columns, the Microline requires one additional number. The Microline and FX-80 have the same number of columns, but use different translation methods. In short, it is very difficult to translate downloadable characters from one printer to the next, especially if you do it manually.

Another difference among these three printers is the escape sequences they use to download characters. Figure C is a summary of the specific escape sequences used by each.

Glossary

c1 = Beginning range of the character being replaced (FX-80 allows a definition to replace more than one character.)

c2 = Ending range of the character that is being replaced (c1 can equal c2)

a = Special attribute byte for descender and proportional spacing information

v = Value of a single column of code numbers

c = ASCII value of character being replaced

d1 = 0 if there is no descender, 1 if there is a descender

d2 = A if there is no descender, D if there is a descender

printer, several things happen. Firstly, your printer looks at the value of the incoming signal. If it's anything but ESC (ASCII value 27), it searches its read only memory (ROM) for the character's dot pattern and prints it. If an ESC character has been sent, though, your printer knows that a special command is coming, and the characters that follow are treated differently. Your software uses escape sequences for all of your printer's type styles and formatting features, such as condensed print, double-strike, italic font, left margin setting, and so on.

It should come as no surprise that escape sequences are the key to the downloading process. There are escape sequences for defining a character, selecting the downloaded character set, downloading the normal character set into the download RAM, and turning off the download character set to return to the normal character set.

Before downloading a character, we must somehow define the new character. The character matrix for the Gemini printer has nine dots across and seven dots vertically. So it's a simple matter to draw in dots to form the new character. However, there is one restriction in non-graphics mode the printer can't print two adjacent horizontal dots, so no two dots can be placed next to each other in a single row. And to provide for characters with descenders ("y," for example), you should specify that you want the entire matrix shifted down two dots.

On many printers, it's difficult to distinguish zeros from the letter "O". To make it easier to tell them apart, I'll define a new zero character that has a slash through it. Figure 1 shows a dot pattern for the new character. The numbers along the left side of the matrix are the basis for the code used to tell the printer which dots make up the new character. Each number along the bottom of the matrix is the sum of the code numbers for each row that contains a dot. These nine numbers (one for each column) completely describe the new character to the printer. If all this seems complicated, don't despair — later on, I'll present a method to simplify this process. After all, why do all this work manually when you have a computer?

Escape Sequences

As you'll recall, an escape sequence tells the printer how to handle the characters that follow. Figure 2 lists the Gemini escape sequences for downloading characters in generic form and in BASIC translation. Figure 3 is a complete BASIC program that will download the new slashed zero character.

The first step is to download the normal character set into the download RAM (Line 50); if this isn't done, nothing would print except the new character. Next, the new character must be defined for the printer (Line 60). This new character definition will overwrite the standard dot configuration for zero in the printer's RAM (but not in its ROM). After this, the download character set is activated (Line 70). Now, whenever you send the printer a zero, it will print the new character. Line 90 cancels the download character set and returns to the normal characters (with the unslashed zeros).

The process described above is a lot of work to go through just to get a slash through a zero. It's tedious to draw the dot pattern on paper and add up the codes manually. Trying to remember all the escape sequences seems impossible, and it makes for error-prone printing. And, once you get the sequence figured out, it's not very convenient to have to load BASIC and run the program just to download a character set. Fortunately, there's an easier way.

Figure 4 is a listing of FONTEDIT, a BASIC program that works on any IBM PC or XT system with an 80-column monitor. The program serves as a character font editor and a simple program generator for downloading character sets. Although I wrote it for Gemini printers, it can be modified to work with other printers that have downloading capability. Consult your printer manual for the proper escape sequences, matrix size, and dot coding methods.

FONTEDIT is menu-driven and very easy to use. First, you designate a file to contain the download information. You are then presented with a blank matrix and some simple instructions. Use the arrow keys to position the cursor to a location where you would like a dot, and hit the F10 key to place a dot in the matrix. If you change your mind, you can remove dots with the space bar. When you think the character looks right, you can test it on the printer before saving it. If it's satisfactory, you can save it to a file.

The file that FONTEDIT creates is actually a new BASIC program. It includes comments so you can see exactly what's going on, and you can even go back and remove a character if you change your mind. FONTEDIT automatically generates all the escape sequences for downloading characters and leaves you with a program that's ready to run.

You can download from one to 96 characters (the limit for Gemini-10X/15X) and continue editing a file at a later time. If you are adding new definitions to an existing file, FONTEDIT will ask you for the next line number.

Line 60 is the basis of the editor, which allows use of the built-in BASIC editing functions and saves a lot of programming. The LINE

```
                 :---:---:---:---:---:---:---:---:---:
            1    :   : X :   : X :   : X :   : X :   :
                 :---:---:---:---:---:---:---:---:---:
            2    : X :   :   :   :   :   : X :   : X :
                 :---:---:---:---:---:---:---:---:---:
            4    : X :   :   :   :   : X :   :   : X :
  Code           :---:---:---:---:---:---:---:---:---:
Numbers     8    : X :   :   :   : X :   :   :   : X :
                 :---:---:---:---:---:---:---:---:---:
           16    : X :   :   : X :   :   :   :   : X :
                 :---:---:---:---:---:---:---:---:---:
           32    : X :   : X :   :   :   :   :   : X :
                 :---:---:---:---:---:---:---:---:---:
           64    :   : X :   : X :   : X :   : X :   :
                 :---:---:---:---:---:---:---:---:---:
                   62  65  32  81   8  69   2  65  62
```

Figure 1: The dot pattern required for the slashed-zero character. Dots are printed in the positions marked with an X and no two dots may be horizontally adjacent.

ESC * 0 **CHR$(27) CHR$(42) CHR$(0)**	Copy the fonts in character ROM into download RAM.
ESC * 1 c d1 v1 v2 ... v9 CHR$(27) CHR$(42) CHR$(1) CHR$(C) CHR$(d1) CHR$(v1) CHR$(v2)... CHR$(v9)	Define the download character into RAM.
ESC $ 1 CHR$(27) CHR$(36) CHR$(1)	Select the download character set.
ESC $ 0 CHR$(27) CHR$(36) CHR$(0)	Cancel the download character set.

Notes: c is the ASCII value of the character being redefined.
d1 is 1 if the character has a descender, 0 otherwise.
v1 through v9 are the ASCII values of the nine code numbers (see Figure 2).

Figure 2: Escape sequences (with BASIC equivalents) for downloading new characters to the Gemini 15X printer.

```
10 REM This program downloads one new character to the
20 REM Gemini printer, tests it, then cancels the download
30 REM character set.
40 LPRINT "The zero does not have a slash: 00000"
50 LPRINT CHR$(27);CHR$(42);CHR$(0); 'downloads the normal character set
60 LPRINT CHR$(27);CHR$(42);CHR$(1);CHR$(48);CHR$(0);CHR$(62);
    CHR$(65);CHR$(32);CHR$(81);CHR$(8);CHR$(69);CHR$(2);
    CHR$(65);CHR$(62); 'Redefines zero to have a slash
70 LPRINT CHR$(27);CHR$(36);CHR$(1);' Select the download
    character set
80 LPRINT "The zero should now have a slash: 00000"
90 LPRINT CHR$(27);CHR$(36);CHR$(0); 'Cancel download
    character set
100 LPRINT "Now it's back to normal: 00000"
110 END
```

Figure 3: A simple BASIC program to download the slashed-zero character.

```
10 'FONTEDIT.BAS:     A character editor for downloading character sets.
20 '                  (This version is for Gemini-10X/15X printers.)
30 '                  (C) 1984, John Walkenbach
40 GOSUB 860          ' Initialize & set-up function keys
50 GOSUB 500          ' Clear screen and label character matrix
60 LINE INPUT ED$     ' This statement is the character editor
70 GOSUB 90           ' When <RETURN> is hit, get new menu
80 GOTO 60            ' Return to editing
90  '-----------------------------------------------------------------------
100 ' Subroutine to generate the Options Menu
110 '-----------------------------------------------------------------------
120 LOCATE 22,1:COLOR 0,7
130 PRINT"F1: Save redefinition to file.        F2: Clear the matrix.         ";
140 PRINT"F3: Exit FONTEDIT                     F4: Test character on printer. ";
150 PRINT"F5: Continue editing matrix.                                         ";
160 COLOR 7,0
170 LOCATE 1,1:INPUT "Press a function key, then <RETURN>: ",F$
180 IF F$="Save"     THEN GOSUB 240:GOTO 230
190 IF F$="Clear"    THEN GOSUB 500:RETURN
200 IF F$="Exit"     THEN CLOSE #1:CLS:END
210 IF F$="Test"     THEN GOSUB 710:GOTO 230
220 IF F$="Continue" THEN GOSUB 620:RETURN
230 FOR R=1 TO 2:LOCATE R,1:PRINT SPACE$(70);:NEXT:GOTO 170
240 '-----------------------------------------------------------------------
250 ' Subroutine to read the screen and write to file (SAVE option)
260 '-----------------------------------------------------------------------
270 LOCATE 1,1:PRINT SPACE$(70);:LOCATE 1,1
280 INPUT "Character to be redefined: ",C$
290 INPUT "Descender (y/n)? ",DES$
300 OPEN FIL$ FOR APPEND AS #1
310 PRINT #1, LINENUM;"REM - Redefines ";C$: LINENUM=LINENUM+10
320 PRINT #1, LINENUM;
330 PRINT #1,"LPRINT CHR$(27);CHR$(42);CHR$(1);CHR$(";ASC(C$);");CHR$(";
340 IF DES$="Y" OR DES$="y" THEN PRINT #1,"1);' descender"
350 LINENUM=LINENUM+10:PRINT #1, LINENUM;"LPRINT ";
360 ' Alternate entry point to read screen - used for TEST option.
370 FOR SCRNLOC=1668 TO 1668+((MATCOLS-1)*2) STEP 2
380   CODE=0
390   N=-1
400      FOR OFFSET=0 TO (MATROWS*160) STEP 160
410         N=N+1
420         IF PEEK(SCRNLOC+OFFSET)=220 THEN CODE=CODE+(2^N)
430      NEXT OFFSET
440   IF TEST=TRUE THEN LPRINT CHR$(CODE);: GOTO 460
450   PRINT #1, "CHR$(";RIGHT$(STR$(CODE),LEN(STR$(CODE))-1);");";
460 NEXT SCRNLOC
470 IF TEST =FALSE THEN PRINT #1,:LINENUM=LINENUM+10
480 CLOSE #1
490 RETURN
500 '-----------------------------------------------------------------------
510 'Subroutine to clear screen and label rows & columns (CLEAR option)
520 '-----------------------------------------------------------------------
530 CLS:LOCATE 9,35:PRINT LEFT$("12345678901",MATCOLS)
540 LOCATE 10,34
550 PRINT CHR$(201);:FOR I=1 TO MATCOLS:PRINT CHR$(205);:NEXT:PRINT CHR$(187)
560 FOR I=11 TO 11+MATROWS-1
570   LOCATE I,31
580   PRINT I-10;CHR$(186);SPACE$(MATCOLS);CHR$(186)
590 NEXT I
600 LOCATE I,34
610 PRINT CHR$(200);:FOR I=1 TO MATCOLS:PRINT CHR$(205);:NEXT:PRINT CHR$(188)
620 ' Alternate entry point - used for CONTINUE option
630 LOCATE 22,1:COLOR 0,7
640 PRINT"Use arrow keys to move to desired dot location.                      ";
650 PRINT"Press F10 to set a dot...  Space bar to remove a dot.                 ";
660 PRINT"Press <ENTER> for Options Menu.                                       ";
670 COLOR 7,0
680 LOCATE 1,1:PRINT SPACE$(70);
690 LOCATE 11,35
700 RETURN
710 '-----------------------------------------------------------------------
720 'Subroutine to test character on printer (TEST option)
730 '-----------------------------------------------------------------------
740 LOCATE 1,1:PRINT SPACE$(70);:LOCATE 1,1:INPUT "Character to replace? ",C$
750 LPRINT CHR$(27);CHR$(64);           'Reinitialize printer
760 LPRINT CHR$(27);CHR$(42);CHR$(0);   'Select normal character set
770 LPRINT CHR$(27);CHR$(42);CHR$(1);C$;
780 IF DEC$="Y" OR DEC$="y" THEN LPRINT CHR$(1); ELSE LPRINT CHR$(0);
790 TEST=TRUE
800 GOSUB 360
810 LPRINT CHR$(27);CHR$(36);CHR$(1)   'Select downloaded set
820 LPRINT "Here is a test of the new character: ";
830 FOR I=1 TO 20:LPRINT C$;:NEXT I:LPRINT 'Print 20 times
840 TEST=FALSE
850 RETURN
860 '-----------------------------------------------------------------------
870 'Subroutine to initialize and set up function keys
880 '-----------------------------------------------------------------------
890 TRUE=1:FALSE=0
900 WIDTH "scrn:",80:CLS:KEY OFF
910 FOR I=1 TO 10:KEY I, "": NEXT I
920 KEY 1, "Save":   KEY 2, "Clear":      KEY 3, "Exit"
930 KEY 4, "Test":   KEY 5, "Continue":  KEY 10, CHR$(220)
940 ' Determine display adapter (B800 for color/graphics, B000 for monochrome)
950 DEF SEG=0
960 IF (PEEK(&H410) AND &H30) <> &H30 THEN DEF SEG= &HB800 ELSE DEF SEG=&HB000
970 MATCOLS=9  'Number of dot matrix columns
980 MATROWS=7  'Number of dot matrix rows
990 LOCATE 3,35:PRINT "FONTEDIT.BAS"
1000 LOCATE 22,1:INPUT "File for output? (1-8 characters) ",FIL$
1010 IF FIL$="" THEN BEEP: GOTO 1000
1020 FIL$=FIL$+".BAS"
1030 INPUT "New file or append (n/a)? ",TYPE$
1040 IF TYPE$="a" OR TYPE$="A" THEN INPUT "Line for 1st new statement? ",LINENUM
1050 LINENUM=10
1060 OPEN FIL$ FOR OUTPUT AS #1
1070 PRINT #1, LINENUM;"REM - Download normal character set":LINENUM=LINENUM+10
1080 PRINT #1, LINENUM;"LPRINT CHR$(27);CHR$(42);CHR$(0);":LINENUM=LINENUM+10
1090 PRINT #1, LINENUM;"REM - Select download character set":LINENUM=LINENUM+10
1100 PRINT #1, LINENUM;"LPRINT CHR$(27);CHR$(36);CHR$(1);":LINENUM=LINENUM+10
1110 CLOSE #1:RETURN
```

Figure 4: The program listing for FONTEDIT.BAS, a font editor and downloader for the Gemini 15X printer. This program can be modified to suit most printers which support downloaded fonts.

INPUT statement keeps accepting input until a Return is entered. You can use the arrow keys to move the cursor around the matrix and the F10 key to place a dot at the cursor's location. When you hit the Return key, control passes to statement 70, which calls the next menu.

The dots placed on the screen are read directly from the screen memory using the PEEK function. The code numbers are added together in lines 370-460, and written to the file with the appropriate CHR$ keywords.

Downloading from BASIC or DOS

When you are finished using FONTEDIT, a brand new program will be on your disk, filed under the name you gave when you started FONTEDIT. As with any BASIC program, you can load, list, or modify it. When you run this new program, it will download your new character definitions to your printer. It will also send the proper escape sequences to load the normal characters into download RAM so any undefined characters will not print as blanks.

After running your new program, the characters that you redefined will print as your new dot configurations. To return to the normal characters, you can send the escape sequence to cancel the download character set or to turn your printer off and then back on.

You can save as many of these programs as you like, as long as they're filed under different names. You can then select a new character set simply by running the appropriate BASIC program.

Although FONTEDIT makes the downloading process much easier, it still doesn't solve the problem of having to load BASIC to download a character set. There are several ways, however, to download new characters directly from DOS. One solution is to compile the new BASIC program. This works, but it will create a much larger file than is necessary. And most people haven't shelled out the cash for a BASIC compiler.

A better solution is to modify the new BASIC program. The modification involves changing the program so it will write all the necessary information to a disk file rather than to the printer. This is done by changing all the LPRINT statements to PRINT#1 statements. This new file can then be sent to the printer directly from DOS using the COPY command.

If your program contains many definitions, you'll want to use a text editor or word processor to make the substitutions. Here's how to do it. First, make sure the new BASIC program that FONTEDIT created is in ASCII format. If you've modified and saved the program, you'll have to load it and resave it with the following BASIC commands:

```
LOAD "CHARS.BAS"
SAVE "CHARS.BAS",A
```

(This assumes the program created by FONTEDIT is named CHARS.BAS.) The "A" will save the program as an ASCII file, which allows you to use it as input to a text editor or word processor.

If you're using a word processor, make sure it can read and write standard ASCII files (use nondocument mode in *WordStar*). Run your editor and load the BASIC program. Add a new first line to the program as follows:

```
1 OPEN "CHARS.SET"
FOR OUTPUT AS #1
```

Substitute the name of your choice for CHARS.SET. I've found that using the .SET extension makes the downloadable files easy to recognize in a directory. Next, do a global search and replace. Substitute "PRINT #1," for every occurrence of "LPRINT". Finally, add a new last line to the program:

```
999 CLOSE #1
```

Save the file, exit your text editor, and get back into BASIC. Now you must run the program one last time. This time it will write a new file, CHARS.SET, that contains all the information for downloading the character set. And you can do it from DOS:

```
A>COPY CHARS.SET LPT1:
```

If your printer is set up as a serial device, you may have to substitute COM1: or PRN: for LPT1:. If the program is short, you can avoid using the text editor and make the modifications manually with the BASIC editor. This is also handy for sending other escape sequences to your printer, such as those for condensed printing, double-strike, italic font, and so on.

Examples of Downloading

I've developed several complete character sets using FONTEDIT (see Figure 5 for samples). FONTEDIT does speed things up considerably. For example, I was able to edit all the characters in the "hi-tech" typeface to my satisfaction in about 2 hours. If I did it manually, I'd probably still be working on it.

There's really no reason to settle for boring typefaces if your dot matrix printer allows downloading. You can create foreign language characters or entire alphabets. Or you can redefine all uppercase letters to print as their lowercase equivalent — an e.e. cummings emulator. If you're not interested in developing new typefaces, you can create just about any symbol you need for professional writing. It's not as complicated as it seems; using your PC to help makes it even easier. ■

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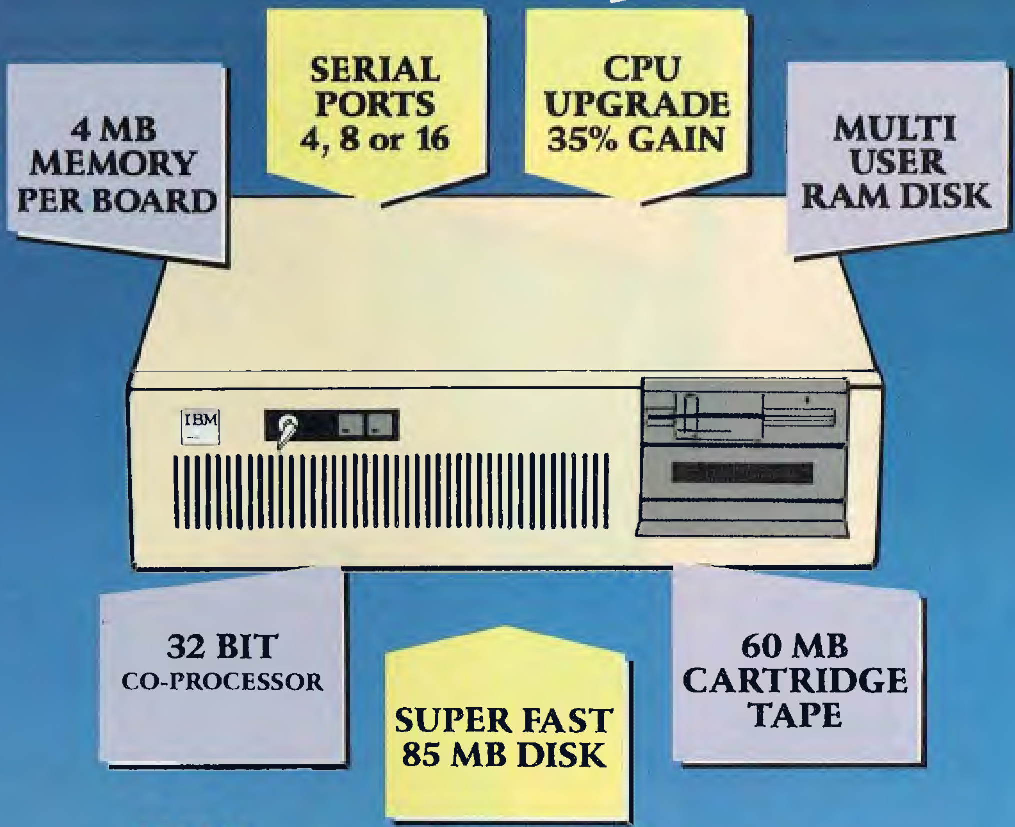

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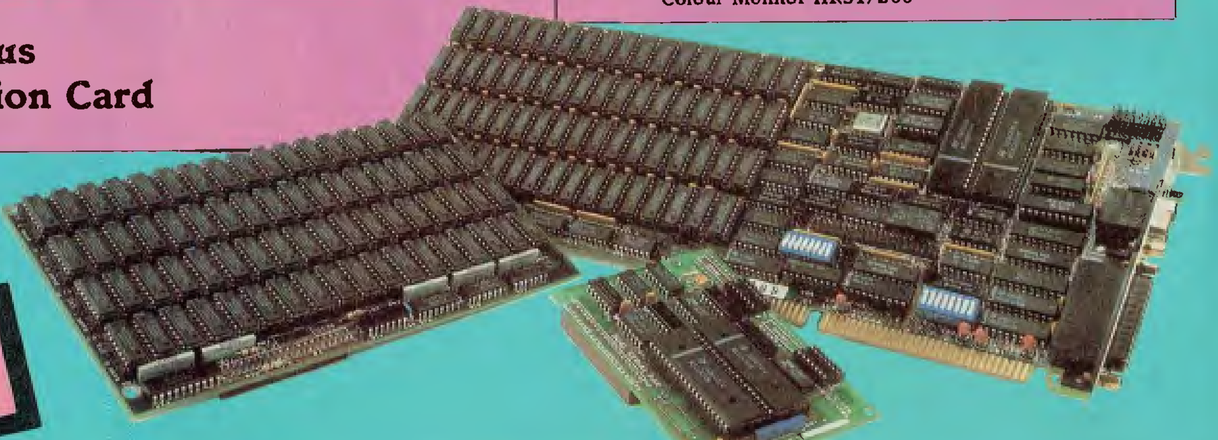

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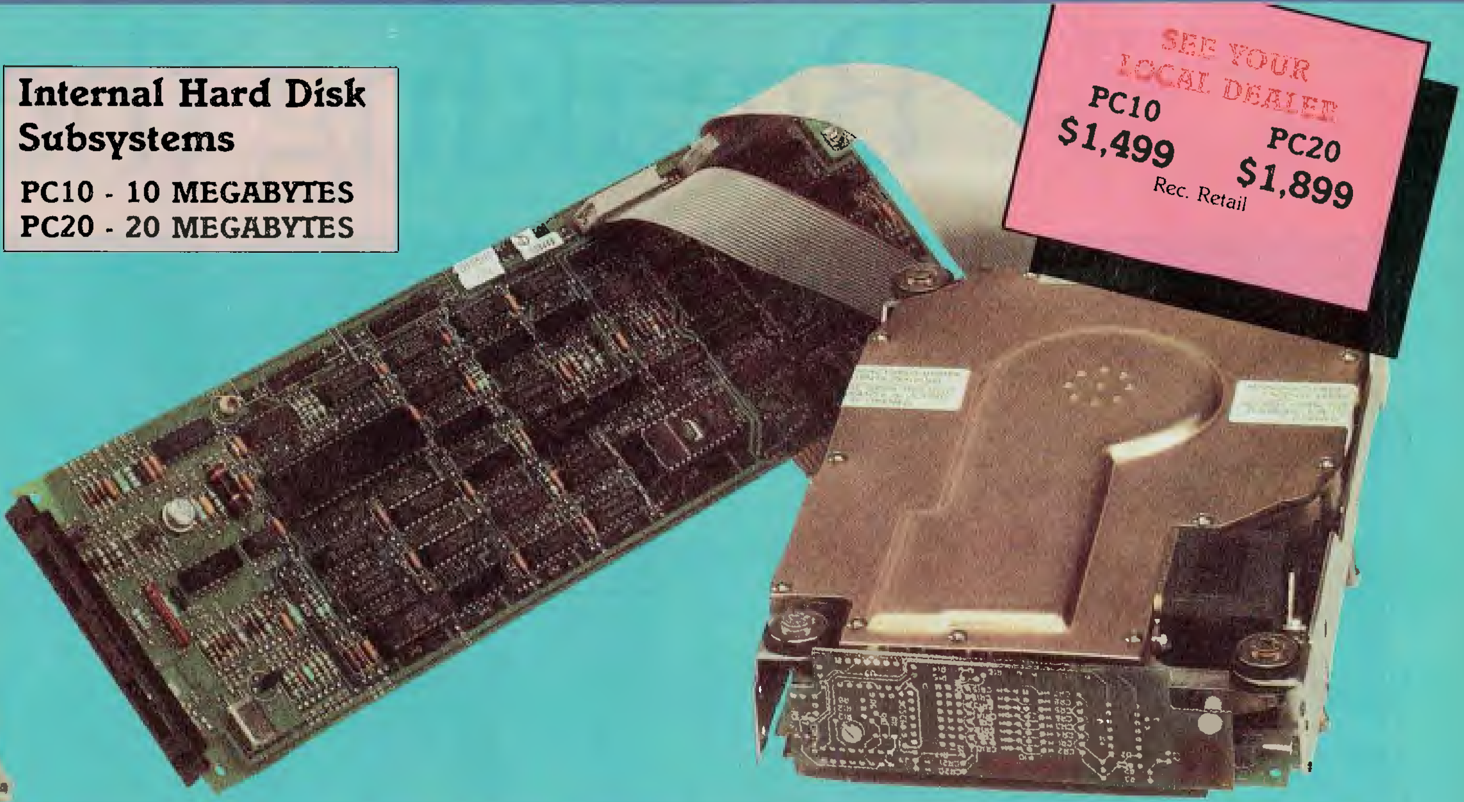

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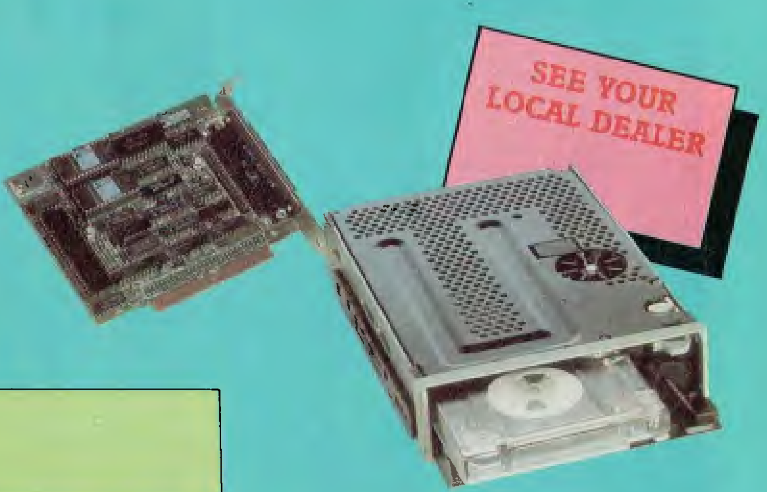

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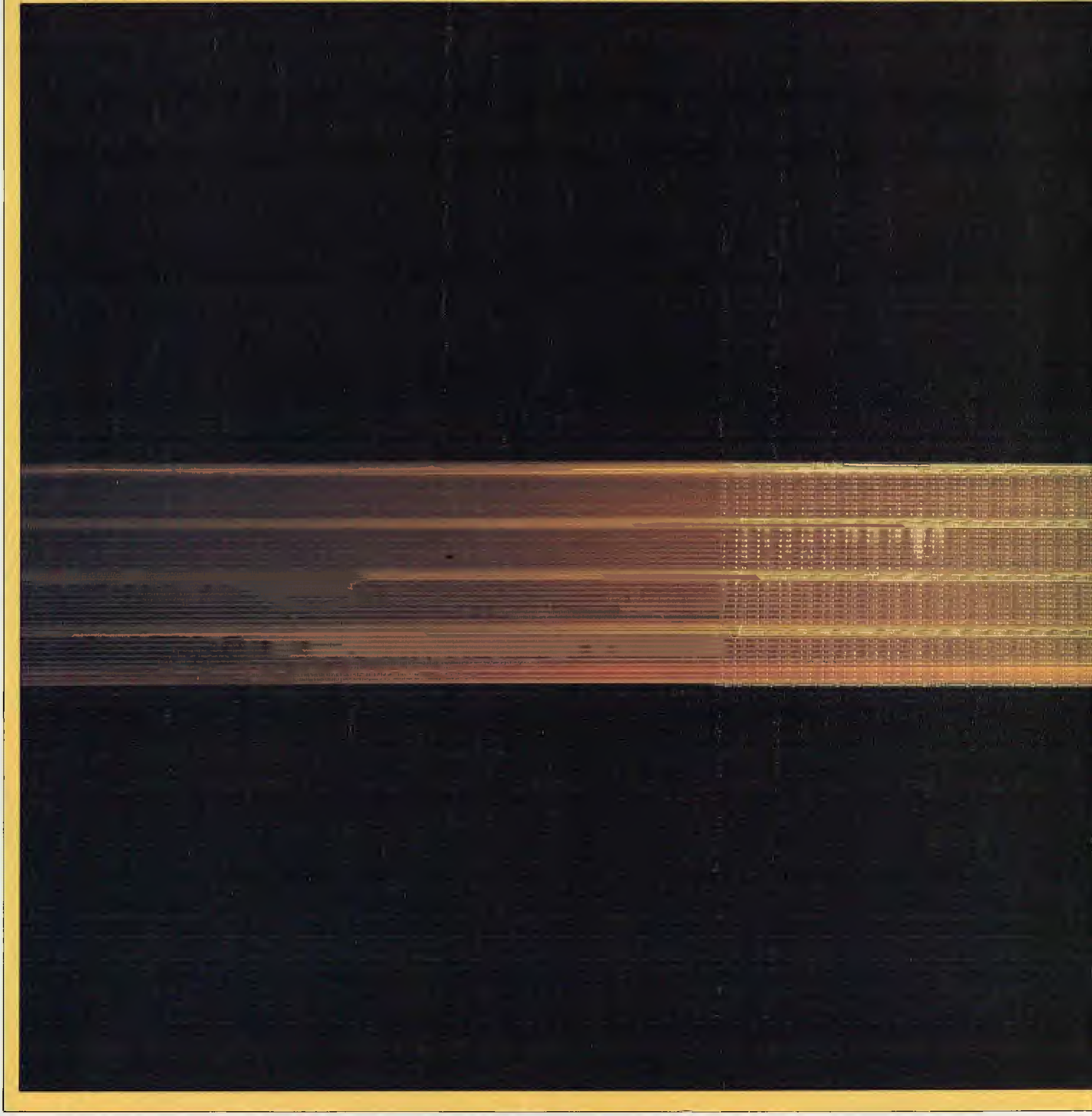
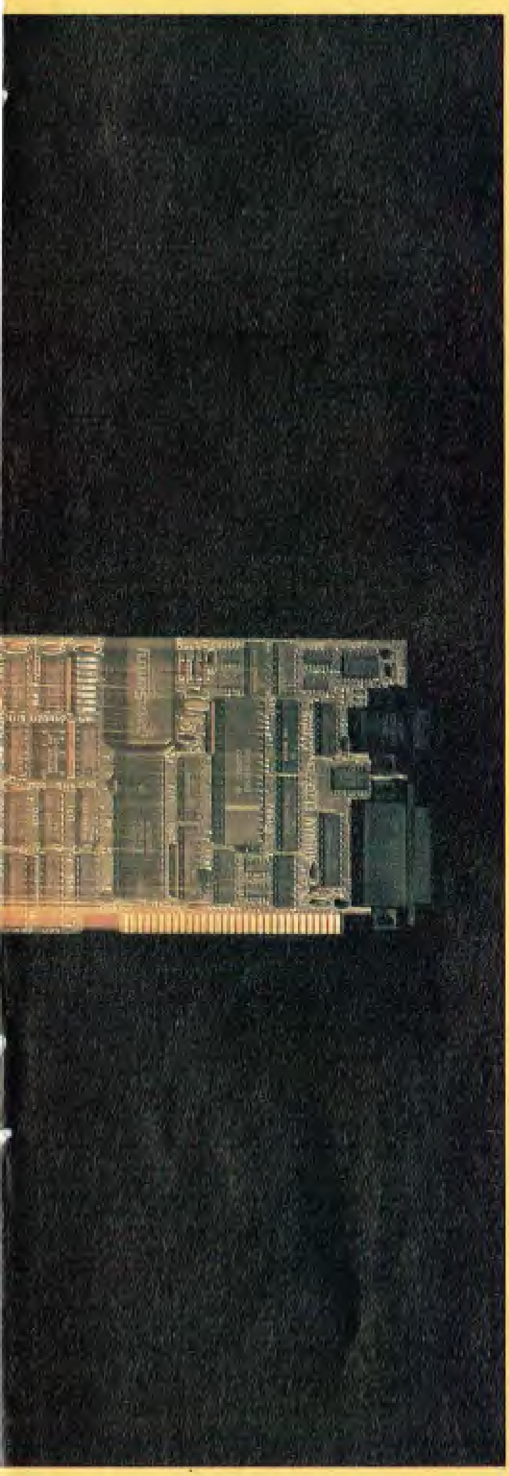


640K barrier



The announcement of the Lotus/Intel/Microsoft Extended Memory Specification (EMS) has resulted in a flood of powerful memory boards which have finally broken through the old and restrictive 640K barrier. Steve Rosenthal reports.

The quest for new frontiers in memory expansion should bring PC class micros closer to the power and capacity of mini computers.

Software and hardware vendors say, even if we haven't noticed it yet, that the time has come to pass the 640K byte limit on space reserved for read/write memory on the PC.

Several routes to memory expansion have been staked out by industry coalitions such as Lotus, Intel, Microsoft, AST, Quadram and Ashton-Tate. Both technical and marketing differences separate the approaches. On the developer side, software and hardware vendors are busy deciding how many and which routes to support.

On the user's side, the likely result will be a generation of new software with more sophisticated capabilities than they have had access to before and space for larger data files.

The result, vendors say, should bring PC-class micros much closer to the power and capacity of minicomputers.

Tecmar President, Marty Alpert, points out that add-on boards which crossed the 640K frontier first appeared less than six months after the PC itself, though the market has, until recently, been a small, specialized one.

Four factors have primarily been responsible for the recent change

- The demand by increasingly sophisticated spreadsheet users for bigger spreadsheet arrays;
- Widespread use of memory-resident utilities and keyboard enhancers;
- The apparently long transition period before most business users migrate to 80286-based machines running in the protected-address mode;
- Efforts by several key firms to define an industry standard approach to memory expansion.

Origin of the species

As originally conceived by IBM and Microsoft, the PC had a total limit of one megabyte of memory, of which 640K was allocated to RAM memory for read/write storage and 384K was reserved for ROM memory containing permanent programs and drivers.

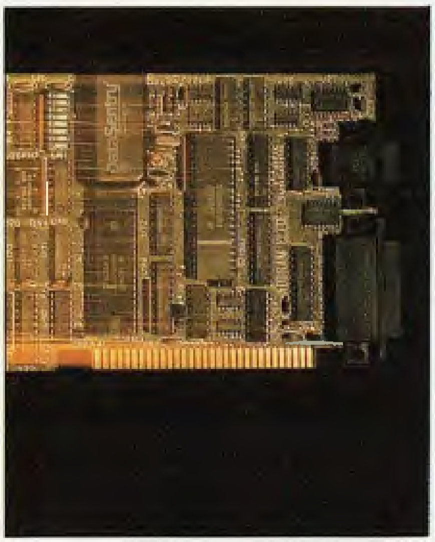
The megabyte limit came from the choice of the Intel 8088 for the central processor, while the 640K/384K split was a choice made during the design of the PC.

However, some popular business programs have now grown to hundreds of kilobytes of code, which users have also pressed for larger areas for data storage. While many users have encountered this problem, the largest single group was users of *Lotus 1-2-3* and *Symphony*

Furthermore, while main programs were getting larger, the sudden popularity of memory-resident accessory programs, such as desktop accessories and keyboard enhancers, quickly made the problem worse.

Users who became fond of having *SideKick, ProKey* or similar programs loaded and ready found themselves dedicating as much as 150K bytes of memory to these helper packages.

Finally, though the advent of the PC AT and similar 80286-based machines promised to give users access to as much as 16M of memory, it turns out that there are serious technical problems blocking a quick or easy upgrade path for current DOS programs. The full memory range is only available in the



80286's "protected" mode, while DOS and most DOS applications only run in the "real" or 8088-emulation mode, with the same 1M-byte limit.

Other operating systems, such as Xenix or PC/IX can use the expanded memory, but even if Microsoft or IBM provide a DOS solution next week, industry analysts say it will probably take at least a year or two for the majority of users to upgrade their systems.

So, while users were asking for more data memory space and programs eating up more code space, and the megabyte limit apparently unlikely to change, both software and hardware designers found the direct route to memory extension temporarily blocked.

The answer, according to most vendors of large-scale memory for the PC, is bank switching, a technology that shares a limited range of addresses among a larger amount of physical memory by switching banks (chunks) of physical memory in and out of contact with the central processor.

Unfortunately, there are many ways to implement bank switching, and the software that uses the extra memory must be written to take into account that particular implementation. Without a standard, software firms were unwilling to go to the effort to write versions of their packages for each different board. And few users, without software to use the expanded memory, were willing to buy bank-switched boards.

There the situation rested until Lotus and Intel Corp. announced their sponsorship of a hardware/software standard for expanded bank-switched memory known as the Expanded Memory Specification (EMS). The Lotus/Intel EMS effort, then, was an effort to set a standard that would promote the spread of standard hardware (which Lotus wanted so it would only have to write and support one version of its software) and standard software (which Intel wanted to create a larger market for its add-on memory boards).

Users would benefit, the two firms claimed, because the standard would allow the rapid growth of a competitive and efficient market.

Given the marketing clout of its two sponsors, the EMS standard quickly drew adherents from both the hardware and software community. Most makers

Technology and terminology

Back when the PC was designed, 1M byte of memory represented an end-user cost of several thousand dollars, and programs typically ran in 64K bytes. Whether it was due to a disbelief that users would ever want or be able to afford more memory or a marketing decision to leave the higher end of the market to other products, IBM's design for the PC made no provision for bigger memories.

The limit of the PC's memory is determined by the design of its "brain", the 8088 microprocessor.

The 8088 chip locates memory by use of address lines. On the 8088, there are 20 address lines to specify where in memory the microprocessor wants to read or write from. The chip's addressable memory capacity, therefore, is two raised to the power of 20, or 1,048,576 bytes.

The address bus, which carries the signals from the process to memory, only contains 20 lines, so even a change in processor chip doesn't help. Furthermore, various sections of ROM containing the BIOS and the fixed-disk BIOS extensions were assigned to permanent addresses starting at 640K (A0000 hex).

The 80286 microprocessor used in the PC AT and compatibles has 24 address lines, giving a possible address space of about 16M bytes.

To run existing DOS software and DOS itself on the AT, however, the 80286 must be run in its more limited "real address mode", which only keeps track of the first megabyte.

One of the minor problems with discussing larger memories for the PC is the multiplicity of terms for added memory. Accordingly, the first section of the Lotus/Intel/Microsoft Expanded Memory Specification (EMS) is devoted to defining what words go with which type of memory.

Conventional memory, says the spec, is the normal bottom 640K bytes that DOS and existing programs have been using. It is "linear" memory, because it is addressed continuously from 0 to 640K bytes. Note, however, that if you're thinking of the hardware side instead of the logical addressing, IBM refers to the memory included on the main system board as "planar" memory, while memory in adapter cards is "I/O channel" memory.

Expanded memory is the paged memory located on one of the EMS cards. This should not be confused with "expansion memory", a common term for memory on adapter cards.

Extended memory, however, is IBM's term for the memory used on the AT in the range between 1M and 16M bytes. So far, under DOS, this memory can only be used for RAM disks, because it is only directly addressable by the 80286 in the "protected" mode. It can, however, be used under PC/IX or Xenix.

of memory boards either have or soon plan to produce a board or board family that meets the standard. Most makers of memory-hungry software have announced similar plans.

Compatible DOS

But the Lotus/Intel EMS standard recently got a large boost when Microsoft announced that all future revisions of DOS would be compatible with it, starting with DOS 3.2

However, not everyone in the industry has been pleased with the Intel proposal. In particular, boardmakers AST Research and Quadram, initially with backing from software publisher Ashton-Tate, have proposed a "superset" version of the EMS standard that they say is upwardly compatible but provides what they say are important advanced features.

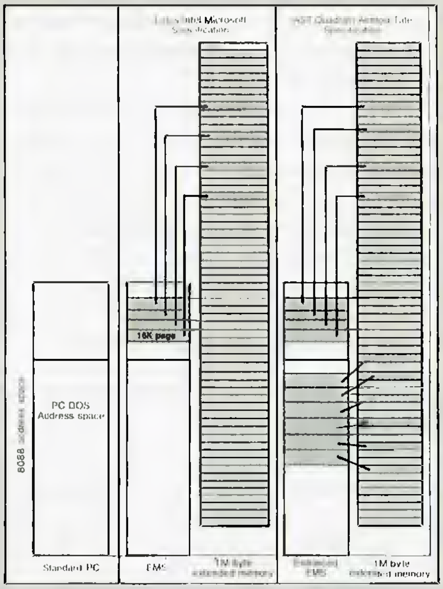
The Lotus/Intel/Microsoft camp, however, says the base level standard is perfectly sufficient, and that changes and additions to a standard will only hold back the industry.

The basic idea behind the Lotus/Intel standard is that, out of the top 360K of the megabyte defined in the PC originally reserved for ROM memory, almost all users have at least 64K that is not actually occupied. Although some of that 360K space is taken by existing uses (the ROM BIOS, BASIC, the hard disk BIOS extension for the XT, video memory and some for other adapters), almost all users have at least one or more free blocks of at least 64K.

In the EMS scheme, this 64K window is used as a "page frame", with the frame holding four pages of 16K each. But instead of assigning those addresses to a single set of memory locations, the EMS scheme lets the software call up any 16K block from the expanded memory card to appear in one of the 16K windows. In effect, even though it costs the processor only 64K out of the megabyte of available addresses, that 64K forms a window to several megabytes of expanded memory.

The AST version of the specification allows this same arrangement, but adds greater flexibility in page size and location. Both approaches require slightly more hardware complexity than some earlier memory-expansion boards that worked only as RAM disks, and both require a software driver that manages

EMS vs. Enhanced EMS



Both the Extended Memory Specification (EMS) and the Enhanced EMS support a 64K 'page-frame' beyond the normal reach of PC-DOS address space. The Extended EMS, however, provides additional pages.

Although marketing considerations may become more crucial factors in determining the advancement of either the Lotus-Intel-Microsoft (LIM) version of the expanded Memory Specification or the AST-Quadram-Ashton-Tate variation, there are some technical differences.

As the AST camp carefully points out, nothing in the two versions conflicts at the level of basic features. However, developers of the AST version claim its added features yield greater flexibility.

But while programs designed for the LIM version will run under both variations, AST-oriented software may not run under LIM-oriented systems.

The most-important difference between the two specifications is in the number of allowed windows, pages and page size.

The LIM spec calls for a single window using a fixed page frame of 64K bytes, with a maximum of four pages of 16K bytes each. By contrast, the AST version allows multiple windows, with variable-sized pages, as long as they start on a 16K-byte boundary.

The LIM spec also requires that its window be located in a contiguous 64K-byte segment somewhere between 640K bytes and the top of memory.

The AST version can use fragmented windows, which can be located either in the upper 360K bytes or in the lower 640K bytes normally managed exclusively by DOS.

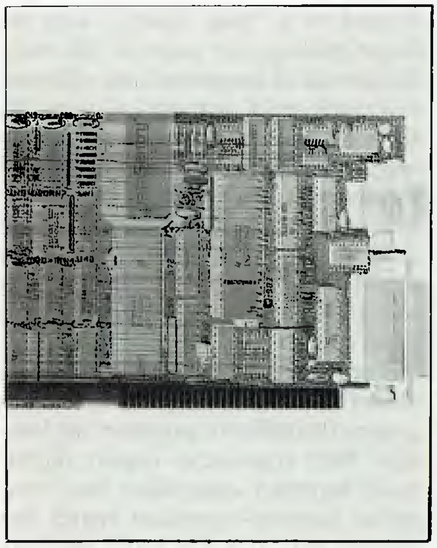
Backers of the LIM spec say allowing the paging of the normal 640K bytes will lead to compatibility problems, while AST proponents point out how much more efficient that approach will be for multitasking and multiuser software.

It's important to remember that, to use a window in the lower 640K bytes, the memory hardware at that address must have been designed to facilitate bank switching, so this feature can't always be used with existing hardware.

To control its added features, AST-specification hardware has 64 page registers, compared with the four used by the LIM version.

However, by using a pointer register to select groups of four at a time, the AST boards only require one additional input/output address.

For most ordinary applications, the total amount of time consumed by either approach is likely to be a small proportion of program-execution time.



the memory in conjunction with EMS-modified application programs and DOS.

Choosing sides

As AST Product Manager, Jerry Bower, sees it, the AST version "is a complete superset. We do everything the Lotus Expanded Memory Specification does and we do some more".

At Quadram, Keith Cook promotes a similar view: "We are not creating a standard that in any way conflicts with their standard. Our enhancements simply go beyond their specification. This is a really fast-changing market, and you're always going to have enhancements and improvements."

Furthermore, Bower says that his side is not spoiling for a fight. "We want to minimize the adversarial nature of this. We've given more capability to the software developer. Let them choose."

Ashton-Tate, which had been one of the earliest backers of the original Lotus/Intel standard before becoming aligned with AST, now also takes a more neutral stand.

According to Vice President, Ron Posner, Ashton-Tate "will support any memory enhancement that is chosen by a significant portion of their customers". In his view, "there's only one standard, with just a slight variation between manufacturers".

Because of the way DOS and most applications are written, existing programs cannot make any direct use of the expanded RAM, and will therefore see no improvement with EMS boards aside from the ability to use the memory as a RAM disk. In fact, say most industry analysts, initial purchases of the EMS board will probably be concentrated among owners of the upgraded *Lotus 1-2-3* and *Symphony* or Ashton-Tate's *Framework* packages.

Programs that are upgraded to use the EMS will probably show some performance improvements as well as handling larger data collections. For example, Scott Brown, Ashton-Tate's technical public relations manager, says, "*Framework* will show an improvement, because it is a RAM-resident product."

However, he warns that other programs, such as his firm's popular *dBase II* and *III*, probably won't be rewritten because they would gain little from access to more memory. Instead, he says, it would be better to use the extra memory for a RAM disk,

Along with spreadsheets, several firms with more specialized software are reputed to be working on versions that will make use of expanded memory, but none has yet made formal announcements. Two that are mentioned most frequently, however, include Borland International (with its *SideKick* and *SuperKey* memory-resident programs) and *Autodesk* (with memory-hungry *AutoCad*).

However, "some of the products that will make best use of the specification haven't been invented yet," says Jim Kinlan, manager of technical marketing at Lotus. "The original reason Lotus got involved was because our users were telling us they were running out of memory. That was true of *1-2-3* users and it was even more true when people converted to *Symphony*. But when you give people more power, people will find ways of using it."

What's more, Kinlan said, the power of the 80286 has not really been tapped yet by most users. "We're not shy to say this is totally an interim solution. I think you'll see people migrating to [the 80286] protected mode in 1987. You might even see something before then."

Steve Rosenthal writes for PC Week

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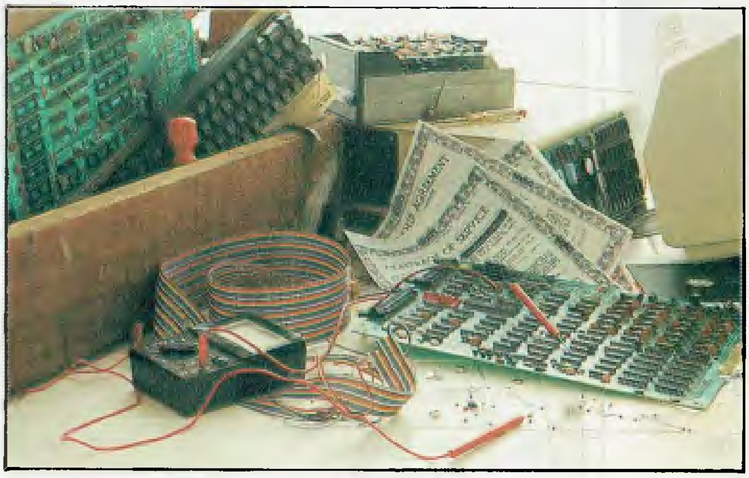
Power-up error codes

The IBM PC pioneered power-up diagnostics, a collection of beeps and code numbers described here by Jack Wright.



Every time a PC is turned on, no matter which operating system is used or what disk is in the drive, the PC first cycles through a sequence of diagnostic tests contained in the BIOS ROM. The tests (except for the RAM test) are also done every time Ctrl-Alt-Del is pressed. If any of these tests fails, the result is an unusual sequence of beeps, a cryptic error code on the display, or both. What follows documents these error beeps and codes.

A failure of one or more of these tests can occur, not only if a component in the PC fails, but also if the system is reconfigured with a switch set incorrectly or if a defective expansion board is installed.

Table 1 presents the tests *in the order* in which they are performed. Thus, if you get one of these error messages, you will know that all the tests that are listed above that message in the table have been performed correctly. This can help in pinpointing the problem.

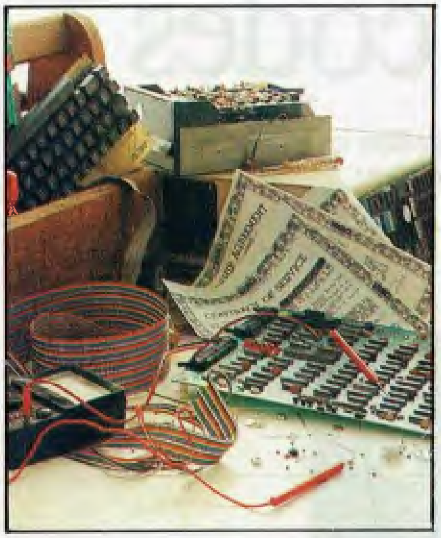
If you have the IBM Expansion Chassis, the messages above should always be interpreted as if you had a 256K system board. This is true because IBM supplies all Expansion Chassis customers with the 256K-system-board ROM.

You can customise the PC's response to the PARITY CHECK errors by writing your own interrupt 2 routine and having the AUTOEXEC.BAT file install it for use at boot-up. If the parity error always occurs immediately at boot-up, before the new interrupt 2 routine is installed, this of course will not work. But if your PC has ever suddenly shut down with a PARITY CHECK 1 or 2 error in the middle of a program, a custom interrupt 2 routine might allow you to remain up and possibly salvage much of your work, if the memory problem causing the parity error is not in a critical memory area used by DOS.

In emergency cases, parity checking can be disabled at any time by sending 0 to I/O port AO. It can be turned back on by sending 80H to the same port. Some memory cards also have DIP switches that can be switched off to disable parity checking on that card. This can help to isolate the problem if you have more than one memory card. Generally, though, disabling parity checking is unwise. For example, think of the problems that could be caused if an undetected parity error occurred while the DISKCOPY command was in use.

It is interesting to note that these power-on diagnostic tests were put in the PC not just for the benefit of the end user in testing the PC every time it is turned on, but for several other important reasons as well. These tests give IBM an efficient method of burning in the PC on the assembly line, they assist technicians in repairing defective PCs, and they aid dealers in configuring PCs for the customer.

When a PC is manufactured, IBM sets it up to cycle through these tests (plus some other special diagnostic routines) repetitively for three hours during the assembly line burn-in; this weeds out most of the "infant-mortality" failures that can occur. Any error that does not allow the disk drive to function will make it impossible for a repairman to load any diagnostic programs from disk. When this occurs, the ROM test routines can be run and may help find the problem. Finally, if a dealer or



customer improperly configures a machine, the tests will, in many cases, point out the problem.

If you own a PC with a large memory, you know how time-consuming the RAM test can be and how rarely it finds a problem. If you do any machine language programming, you quickly begin to wish that the RAM test was not done *every* time the PC is turned on. Machine language programs in the debugging phase have a nasty habit of hanging up and responding only to the big red switch. IBM provides no way to skip the RAM test on power-up, nor is there any easy software fix.

Skipping the RAM test is not really risky, since the hardware parity checking present in all PCs provides a constant check on RAM data security. It does this by halting the PC with a "PARITY CHECK" message whenever a memory parity error occurs. This happens whenever an odd number of data bits change in a byte between the time it is written and the time it is read. Since RAM consists of 64K x 1 chips, a single failing chip can cause only a 1-bit error, thus triggering a parity error and forcing a type 2 interrupt (see also the references to the type 2 interrupt above). ■

Jack Wright works in the hardware and software development department of a large electronics firm.

Table 1: PC Diagnostic Tests

SYMPTOM	CAUSE
1. System does not respond at all when turned on	The power supply has shut down, OR: The 8088 has HALTed due to: — Internal 8088 problem — BIOS ROM checksum error — 8253 timer problem — 8237 DMA controller error — Error in 1st 16K of RAM NOTE: Try turning off power supply, waiting 5 secs., then turning it on.
2. System beeps: 1 long beep, 1 short beep (1 long beep = 3 sec., 1 short beep = 1 sec.)	The 8088 has HALTed due to: — 8259 interrupt controller error — 8253 timer counting too fast or slow
3. System beeps. 1 long beep, 1 short beep, but continues the power-up sequence	Checksum error in a BASIC ROM (64K system board only)
4. System beeps: 1 long beep, 2 short beeps, continues power-up sequence. See also 11 below.	Error in video RAM, or error in 6845 video circuitry
5. System beeps: 1 long beep, 2 short, 1 long, 2 short (64K system board only)	The display card is probably not installed
6. '1801' appears at top of display	Error in the Expansion Unit Interface
7. 'XXYY 201' appears at the top of the display, where XXYY = four hexadecimal digits	RAM error. XX = high order byte of the failing segment; e.g., XX = 20 would indicate that the error occurred between segment 2000 and segment 2400. (Memory is tested in 16K blocks; each 64K increments the segment by 1000.) YY = the failing bit pattern, which can isolate the specific RAM.
8. 'XX 301' appears at the top of the display, where XX = two hexadecimal digits	Keyboard error. Usually a stuck key, where XX — the scan code of the stuck key.
9. '131' appears on display	Cassette port error
10. '1701' appears on the display	IBM Fixed Disk error
11. System beeps: 1 long beep, 2 short beeps, and 'ROM' appears on the display	Checksum error in a BASIC ROM (256K system board only)
12. '601' appears on display	Disk drive A: or disk adapter error
13. 'PARITY CHECK 1' appears	A RAM parity error has occurred on the system board. The INT 2 routine in the BIOS gains control and HALTs the 8088 when a memory parity error occurs. Parity checking had been DISABLED prior to this point in the test sequence, and is enabled here just before booting.
14. 'PARITY CHECK 2' appears on the display	A RAM parity error has occurred on an add-on memory board. This message comes from the BIOS ROM's INT 2 routine, which then HALTs the 8088.
15. 1 short beep	This is the normal system response just before the system boots.

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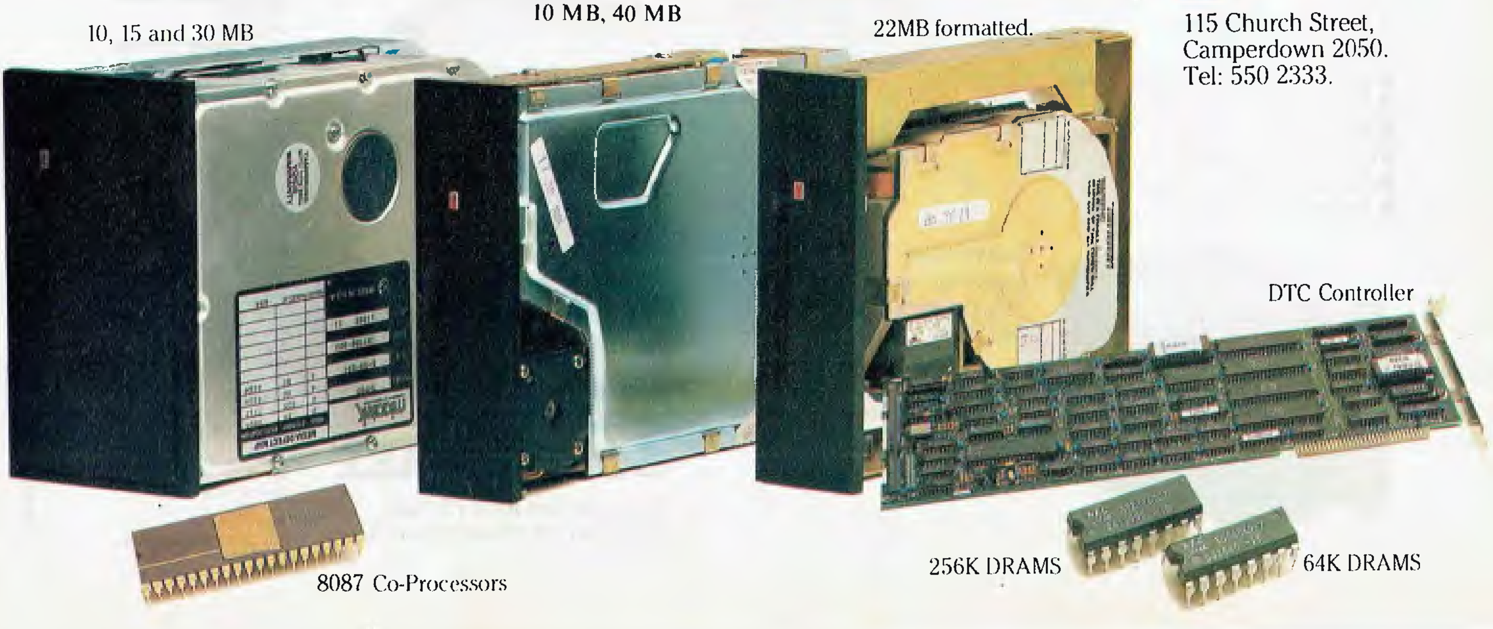

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PC ESSAY • JIM SEYMOUR

Word processing wars

Seen from the outside, the word processor market looks like a battlefield where "Word Wars" intense enough to make the Punic Wars look like a sandbox squabble continue to rage. Read the ads and the best-seller lists, and you see a number of apparently healthy, vital competitors jockeying for position.

Behind the scenes, however, the situation is actually more settled. It resembles the mature form of a classic consumer-goods market: a couple of dominant products and a few struggling competitors.

When major companies conduct product reviews to pick what will become the standard, company-approved-and-supported product for their employees' use over the next few years, the results are depressingly predictable.

Lots of good programs go into the review process — *WordPerfect, Samna+*, *Office Writer, MultiMate Professional, Microsoft Word, Display Write/3,* maybe *Xy Write* — but in the end it comes down to two. Usually, the same two: IBM's *Display Write* and Ashton-Tate's *MultiMate.*

What the evolution of the market toward these two products says about us and our buying habits is interesting, if less so than what it says about the present state of the PC software business.

The reference to the Punic Wars isn't far off. When the Wars began in 264 B.C., the great city-state Carthage (read: *MultiMate*/Ashton-Tate) ruled all of North Africa, the important islands off its coast, and also controlled virtually all the commerce in the western Mediterranean. That other great city-state, Rome (read: IBM), had been busy elsewhere, concentrating on its home turf, and had nearly finished subjugating the Italian peninsula.

Fighting three great wars over the next 118 years, the Romans and Carthaginians bet their futures on a furious battle for dominance. Careers and reputations were made and lost: Regulus lost his armies to the Greeks; Hannibal marched across the Alps (and into the history books) to invade Roman territory; and Cato the Elder brought on the final slaughter by demanding that his Romans not merely defeat but destroy the Carthaginians.

Carthage finally fell. Its citizens were dispersed as slaves and the city was rased, the ground ploughed up to obliterate its former location.

One can make too much of historical allusions, and I don't mean to suggest Big Blue plans to explode the competition. Yet, the state of the word processing market, at least on the corporate level, where the major vendors insist they must win to remain in the game, gives pause.

You and I are not innocent, because we've given both programs their status in the market. *MuiltiMate* gained its substantial lead in word processing largely because it resembled a brand-name product many of us knew and liked — Wang word processing. IBM edged in by porting to the PC a good program from its dedicated word processor, the *Displaywriter* — and also, of course, from the pixie dust that falls naturally from those three letters.

So corporations pledge their troth to two programs that, while good, suffer from a stuffy, overblown approach to what is, after all, a fairly simple situation: grinding out office correspondence and reports.

Display Write/3's nickname among some of my friends who use it is "Menus, Menus, Menus!" Unlike its ancestors, *Textpack 4* and *6* on the *Displaywriter, Display Write/3* lacks a convenient, fast menu bypass option. Instead, it's A, ENTER; B, ENTER; C, ENTER . . .

And keystroke economy? Three taps to start underlining a passage, three more to get out. Ditto for boldfacing.

MultiMate has menus, too, but relies a lot on Ctrl-this, Alt-that use of the PC's function keys. That's OK, once you've learned it, but the orange and avocado keycap stickers that beginners use to learn the program

leave the machine looking like the loser in a bout with a berserk interior designer from the 1950s.

And inserting, if you haven't seen *MultiMate* in its insert text mode, you don't know what "awkward interface" means. Ask a friend who uses the program to show you, but be polite: suppress your giggles at the big moment.

Despite all that, I like both programs. Each does some things very well, and both do many things acceptably. It's the stuffiness and formality of their approaches to word processing that makes them look so old-fashioned.

Having taught many office workers to use word processors, I'm convinced that you don't need all that structure for most secretarial work — let alone the typical manager's and executive's hands-on use.

But while *DisplayWrite* and *MultiMate* battle to the end — remember what happened to the Carthaginians — both are whistling past the graveyard while waiting for Lotus's probable introduction of its "smart" word processor this year.

Mitch Kapor seems as interested in text as he was in numbers when he and Jonathan Sachs cooked up *1-2-3* a couple of years ago. Everyone in the word processing field talks about "becoming the Lotus of the word processing market." But, now Lotus wants to become the Lotus of the word processing market.

What's a "smart" word processor? The best way to describe what the new generation of word processors will do that the current ones cannot do is to imagine a small, attentive servant with a very good memory living inside the program.

This "software agent" — that's the term program designers are starting to use — watches carefully what you do, how and in what order, then learns and remembers your working habits. If there's a principle to which software agents subscribe, it consists of not asking you any more often than necessary what you want to do and guessing, wherever possible, what you are going to do next, based on what it deduces from what you've done so far.

Let's say you routinely write documents in four styles: very short letters with wide margins, longer letters with narrower margins, memos starting with the word MEMORANDUM in widely spaced boldface at the top and the usual "To:" and "Re:" format, and long text reports with underlined subheads at the left margin.

One way to ease your word processing burden would be to construct templates, or empty documents, in each of these styles, save them to disk, then call one up and fill it in every time you produce something in that format.

A "smart" word processing program would eliminate all that. By watching your early use of the program, it could learn your preference for document style. Then, whenever you began a new document, it would automatically select the format for short letters. As the amount of text you typed grew, it would realize that you were doing a longer letter and would change the format settings. The first time you typed a subhead at the left margin, it would realize that this was supposed to be a text report and set up everything in that style.

And if you began a page by typing an M, hitting the space bar, then typing an E, it would change to the memo format, type out the balance of the word, down-space a couple of lines, tab to where you wanted the word "To:" and type it in, then await your input of the recipient's name.

A truly smart word processor can also offer an enormous range of other useful and powerful features: for example, maintaining a constant, on-line spelling checker and a synonym finder.

Don't look for everything under the sun in Lotus's new word processing package — it's the first of a new generation — but expect a lot. Yet in a market already dominated by two hot products — one a product strategically important to IBM — who will seriously consider a Lotus entry.

Don't underestimate Lotus. Remember *Visi-something?*

It's true that IBM's clout means *DisplayWrite* often gets a "bye" into the finals of these "let's pick a word processor" contests. Unfair, may be; a fact of life, yes.

Remember, after all, that the corporate people running these little jousts are themselves users of *1-2-3,* many of them microcomputer support managers and power users who built their careers on their expertise with an affection for Lotus. Think they won't smile on Lotus's test product?

Even if that group doesn't fall for Lotus's word processor and its adapt-to-the-user style, the people who are going to review their recommendations will almost certainly be Lotus users themselves. So, if the Lotus product isn't at the top of the list of recommended choices, the people on the committee are going to get some awkward phone calls from above.

The current generation of high-end word processing packages for the IBM PC and its compatibles are the last doyens of a grand old breed, the concluding and highest expression of the saw-and-hammer approach to building documents.

We can safely assume that IBM has thought of that, too, and so have the former MultiMate International people now on the payroll at Ashton-Tate. The question is whether either group can manage that huge conceptual leap to power drills and numerically controlled lathes before the Cambridge tidal wave hits their beaches. ■

Jim Seymour is a consultant and market analyst in the computer industry.

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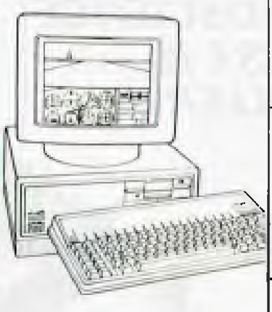
720kb Floppy Drive	add $100.00
8087 Co-processor	add $490.00



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Compatibility by Design. At Advanced Logic research, the System 2B6 was designed to be 100% IBM PC AT bus compatible with full attention paid to the BIOS ROMs resulting in total support of IBM DOS 3.0, 3.1 and Xenix™ operating systems.

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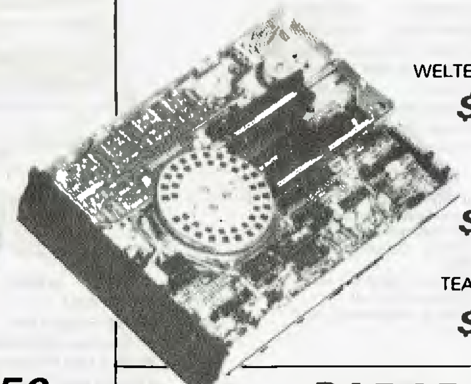
Note: TEAC works on IBM controller
WELTEC 1-2 MB requires controller



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ALR PC

- 8088-2 Processor 4.77MHz/8MHz
- 64 KB - 1MB on motherboard
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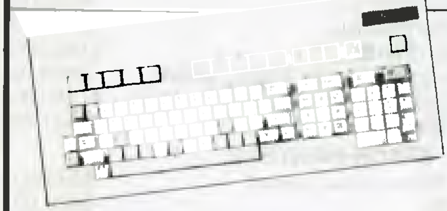

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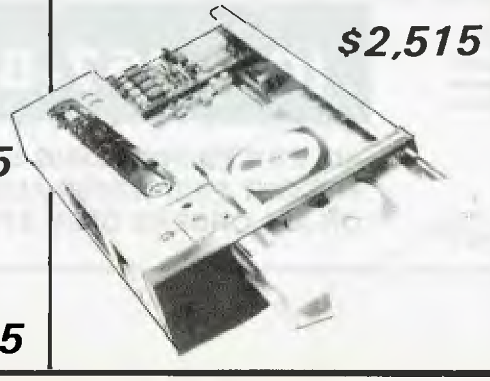

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New products

IBM combine

IBM Australia has announced the System/36 PC processor which attaches to an IBM Personal Computer. The entry-level System/36 consists of the IBM 5364 processor, housed in a desktop-size cabinet, attached by cable to an IBM PC, PC XT, or PC AT. The PC can serve alternately as a system console, System/36 workstation and standalone PC. The system can also communicate with other System/36 processors and host computers.

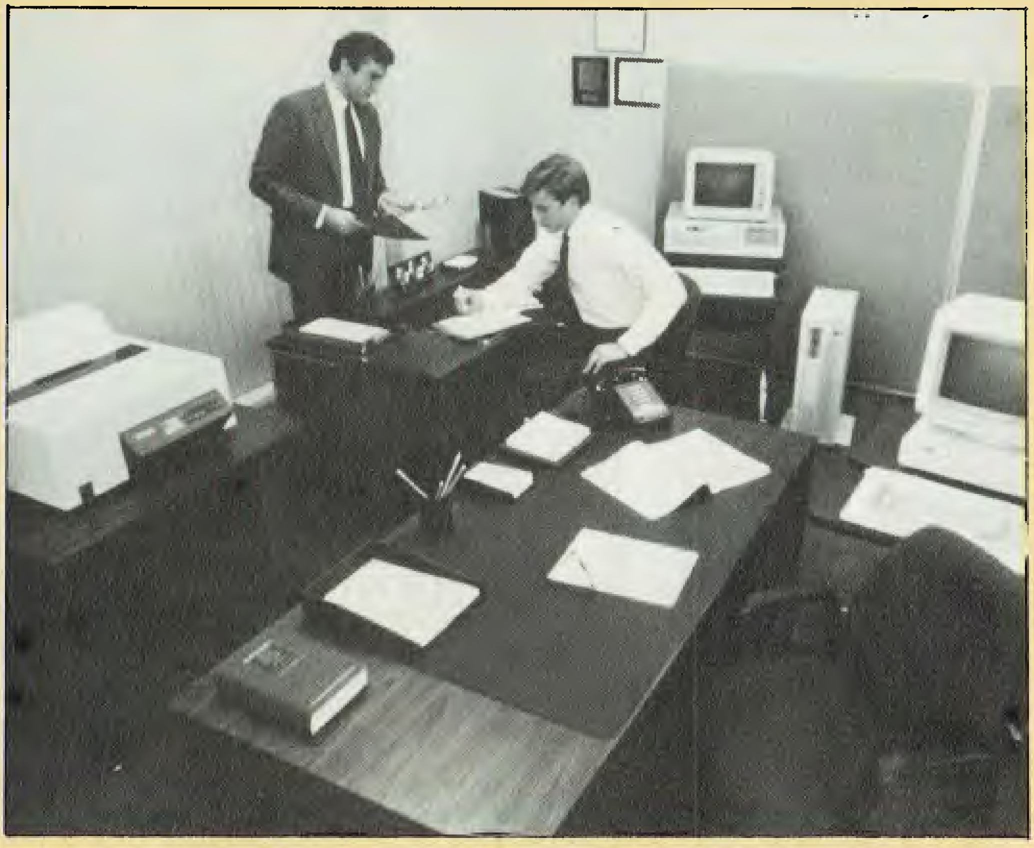
The System/36 PC can perform several tasks simultaneously, and support up to four workstations, including the directly linked PC and any combination of PCs, printers or System/36 displays.

The new system gives users access to IBM and third party programs written for the System/36 and numerous PC programs. Using the PC Support/36 program, PC workstations can share PC data stored on 5364 disks. The 5364 processor comes with 256K that can be expanded to 512K and up to 80M of storage capacity.

Performance of the System/36 PC is about 75 per cent of the mid-size System/36, the 5362 processor. The 5364 has a single 5¼-inch diskette drive for loading System/36 formatted programs. A program enables System/36 data to be converted back and forth between the new processor's 5¼-inch diskettes and the 8-inch diskettes used in other System/36 units.

A cable for the 5364 connects to an attachment card in the back of the directly linked PC. The PC runs an attachment program that enables the processor and part of its memory to be used for System/36 diagnostics, maintenance, communications and other system functions.

Additional workstations are connected to the 5364 by twin-axial cable. The 5364 processor can run System/36 programs while PC workstations perform PC tasks. When a user 'hot keys' a PC to System/36 mode, the PC job is temporarily suspended until the user 'hot keys' back to the PC mode.



The IBM System/36 PC can be used by up to four people sharing data and programs.

System 36 processor

IBM
100 Walker Street,
North Sydney, 2060.
Tel: (02) 923 5123

Utility for controllers

In the world of industrial control, an IBM PC/XT can greatly assist the user in preparing programs for the Klockner-Moeller range of programmable controllers. PS20 IBE, compatible with DOS 2.0 will allow the PC to be used as a powerful on-or-off-line programming tool. Each element is used only in the portions of the program where actually required. Another feature of the software is the ability to duplicate modules of the program in different locations whilst updating the numbers of the elements as the modules are being replicated. This system dramatically reduces both programming time and typographical errors resulting in shorter commissioning and de-bugging times.

The software allows the IBM PC to be used as an on-line fault-finding tool, indicating the status of any program. An additional module connected to the PC serial port enables the programming of EPROM packages, once the operating parameters of the system have finally been determined by commissioning.

Any program is only as good as the documentation provided. By utilising the PS20 IBE software, it is possible to produce documentation to the customer's requirements. All programmable controller programs can be stored on disk memory together with their associated commentary file for storage and, if necessary, off-line modification.

Programmable controllers

Klockner-Moeller
4 Expo Court,
Mt. Waverley, 3149
Tel: (03) 544 8177

Australian-made business graphics

Graphtime-II is an Australian-developed business graphics package for IBM and compatible personal computers. It is designed for use with *dBase II/III* and *Multiplan* but can be used on its own with data entered from the keyboard.

The package consists of three main modules: business graphics with up to 14 graph types, a full-screen color graphics editor and a text font editor. The graphics editor can be used to create free-form diagrams or to enhance a previously generated graph. The user can select either arrow keys, joystick or mouse to control the graphics cursor.

Graphtime-II can be either menu or command driven. Once data has been entered or transferred it can be modified in many ways with built-in mathematical functions such as Trend and Smooth. All scales and labels are generated automatically with manual override. A macro facility is included for commonly used command sequences and to control slide shows. Macros can call other macros for very long sequences or continuous command loops.

The undo key allows for "what-if" experiments with data manipulation, and removal of the last item drawn with the screen editor.

Display output from *Graphtime-II* can be on either color or monochrome screens using the standard color/graphics adaptor card. Printer drivers are included for a number of popular graphics printers, including color. Color slides can be quickly produced with an Instagraphic camera.

Graphtime-II $95

Multisoft
1121 Hay Street
West Perth, 6005.

High speed modem

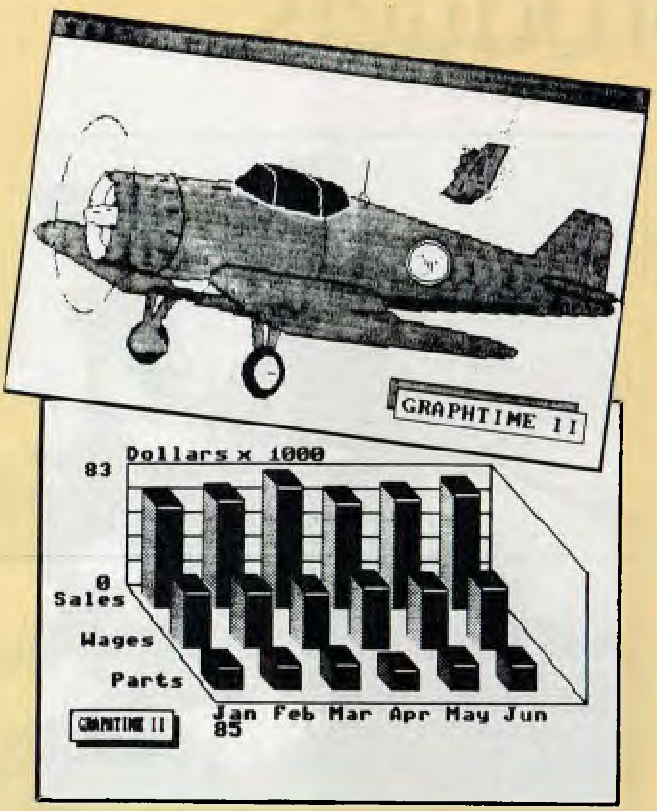
As an addition to its range of medium speed modems, High Technology announces the latest addition of its Australian-designed Courier series switched network modems. The Courier modems are designed to operate on telephone lines at speeds up to 2400 bps (CCITT V22bis). The series includes: Courier 1200, 2400, 1230, and 1234.

All Courier modems are available in synchronous and asynchronous versions. The modems support a superset of the Hayes protocol and perform auto-dial, auto-answer and auto-disconnect functions. A synchronous version is also available to connect to mainframe environments.

The Courier modems have a case that has 8 LEDs displaying link status, and an internal speaker to enable call progress monitoring.

Courier High Speed Modem

High Technology Communications
7 Powell St, Waterloo, NSW 2017
Tel: (02) 698 7987



Graphtime-II: graphs and freeform diagrams.

PC financial calculator

Financial Systems of Australia announces the release of *Fincalc*, a suite of 37 programs which perform financial computations and produce finance schedules covering a wide range of business applications. *Fincalc* is produced as a set of six modules.

The Loans, Leases and Hire Purchase modules include computation of all types of loan, finance lease and hire purchase contracts. Full schedules, including progressive balances, are produced for the term of the relevant contract. *Fincalc* documentation includes over 100 examples of the progams used in problem solving. The system runs under MS-DOS and requires a minimum of 256K and one disk drive.

Fincalc modules are available from $300 up to $560, or as a complete system for $1900. Special rates apply to multiple-machine installations.

Fincalc $300-$560

Financial Systems of Australia
Level 14, AMP Centre,
50 Bridge St, Sydney
Tel: (02) 223 1077

Cross-Cheque

Cross-Cheque allows businesses and individuals to track their income and expenditure. Cross-Cheque is suitable for businesses that are too small to be comfortable with general ledger processing. For professionals and farmers, it can also be used for personal accounts.

Cross-Cheque is designed to allow fast entry of the details of cheques and banking. A useful feature is the ability to handle several cheque accounts and allow the reports to be consolidated over all accounts or to be restricted to one.

Cross-Cheque $240

Custom-Made Software
PO Box 507
Randwick NSW 2031
Tel: (02) 399 8520

Lasernet offers ARC Turbo

Lasernet Computing Systems will be offering a range of products including the American Research Corporation ARC Turbo personal computer system.

The ARC Turbo has 640K on-board memory and an 8088-2 processor. Fully compatible with IBM PC XT software and hardware, the standard ARC Turbo includes MS-DOS 3.1, dual 360K floppy drives, 640K RAM, color graphics, dual serial ports, parallel port, games port, clock calendar and a large 135 watt power supply. Lasernet offer a full 12 months national warranty.

ARC Turbo

Lasernet Computing Systems Pty Ltd
248 St Kilda Road,
St Kilda VIC 3182
Tel: (03) 534 0489

If your office looks like this - we can help you.

When you're up to your neck in crocodiles, it's too easy to forget that your goal was to drain the swamp. Modern Business is often like that. We get so involved with today's deadlines, we never have a chance to stand back and think.

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SuperProject from Sorcim/IUS can help you plan…anything. You just sit at a terminal and describe all the things to be done, by whom, for how long, and in what order.

Each resource has its own calendar and you can see the project in detail or in overview.

SuperProject tells you the cost, the finish date and who's over-committed. All the critical activities are highlighted in red.

SuperCalc3

SuperCalc^3 Release 2 from Sorcim/IUS is a classic spreadsheet with some key differences. Precious memory is only used by cells holding significant data. Your model can be as large as 9999 rows by 127 columns. There is no need to change disks to graph results. It's up to 10 times faster.

You can move across whole pages with a single keystroke. And print your results sideways.

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These are complete packages – but with restrictions on storing and printing. SuperCalc^3 and SuperProject include a demonstration. You'll need an IBM PC, XT, AT or close compatible with 256K memory. Call (07) 529522, (02) 9574678, (03) 519446.

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The new Microsoft Mouse Version 5.0: improved design, higher resolution and near silent operation.

Enhanced Microsoft mouse

Microsoft has announced a new version of its mouse pointing device, version 5.0, at the same price as the previous versions. The new mouse features higher resolution and near-silent operation on all surfaces.

As a pointing and selecting device, the mouse gives users a simple way to recognize and select words, commands, icons, cells, or other objects on the screen. Both the bus and serial versions of the Microsoft Mouse are equipped with this feature. Resolution has been improved. It takes one-half the amount of mouse motion to move the cursor across the screen, when compared to the previous version or to other mouse pointing devices.

The new version offers a set up program, PC Paintbrush, a Mouse driver, Mouse menus (version 5.0), and documentation. Also included with the Mouse are Piano, the Game of Life, and Microsoft Notepad. The Microsoft Mouse supports Microsoft Word, Multiplan, Project, Lotus 1-2-3, WordStar, VisiCalc, and other software that is designed for use with a mouse pointing device. Minimum system requirements for the new Microsoft Mouse are 64K, DOS 2.0, one disk drive, and one RS-232C serial port. System requirements for the new Microsoft Mouse (bus version) are the same except that in place of the RS-232C serial port, an auxiliary card slot is required.

Microsoft Mouse

Burson-Marsteller,
19th Floor, 1 York Street,
Sydney, NSW, 2000.
Tel: (02) 27 3571

Microsoft JX

Microsoft has announced the availability of a number of its application and language packages for the newly released IBM JX computer. Available at the same price as IBM PC versions, each package is designed around the 3½ inch disk format compatible to the IBM JX. The packages available in this format are: Microsoft Serial Mouse, Multiplan, QuickBASIC, Pascal, Fortran, Cobol, Macro Assembler, C Compiler and Microsoft Windows.

Microsoft JX software

Microsoft Pty Ltd
PO Box 95
Forestville, NSW 2087 Australia
Tel: (02) 452 5088

Making Hayes

Hayes Compatible Multifunction Modem.

High Technology Communications announces its release of the V21 / V23 Multifunction range of auto dialling and manual modems. Using front panel switches the modems may be configured into Originate, Answer or Auto-Answer modes and an auto dialling (Hayes compatible) version is available.

Full implementations of the CCITT V21 & V23 recommendations are incorporated in the modems, and may also be configured for Bell standard operation. A baud rate converter option is available for the manual version where the RS232 data stream is converted into 1200/1200 bps.

Multifunction range. $495 (manual) $620 (auto)

High Technology
Communications
7 Powell St, Waterloo,
NSW 2017
Tel: (02) 698 7987

It takes 424 to Tango

Creative Communications, a videotex consultancy based in Sydney, has been developing videotex services for over two years. Their own large database on Viatel is called Tango. By selecting page *424# to Tango, Viatel users gain access to information on the latest hardware, software and computer shop specials. There are also special Bulletin Boards (for authorised dealers only) and directories for computer companies providing prices, promotions, peripherals and configurations.

A PC Chat Board for all Viatel users provides a facility for specific questions or problems to be answered by the PC Shops. For a directory listing, a one page bulletin, updated every quarter is available for $200 per year. To promote this new service Creative Communications is launching a Summer Buyers Guide for computer shops, complete with an ordering service, as well as a public trading board for buying and selling PCs.

424 Tango

Creative Communications
5A Quadrant Court
197 Military Rd,
Neutral Bay, NSW, 2089
Tel: (02) 908 4099

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MultiMate SPELLER and TUTORIAL
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1-2-3 Spreadsheet, Graphics, Information Management Plus.

It's shocking.

Most effective data base management packages are so complicated to program and difficult to use that much of their power is wasted.

And trying to link them with other systems or packages can often be nothing short of impossible. But now there's one that is different.

Meet POWER BASE, the first data base program that combines real computer power with real simplicity.

POWER BASE is so strong it can effectively relate to more than ten different files.

And because POWER BASE comes equipped with POWERLINK, it quickly integrates functions like graphics, word processing, spreadsheets and mainframe files.

POWER BASE can move data freely in and out of a variety of powerful stand alone programs, like LOTUS 1.2.3., MultiMate, Microsoft-Chart, Microsoft-Word and Microsoft-Multiplan.

But the true beauty of POWER BASE is its simplicity.

You can use it immediately, no matter what your level of computer knowledge.

That fact helped earn it the number one rating for a data base management program in 1984. And again in 1985.

For example, according to Software Digest's March 1984 Ratings Book, POWER BASE was rated the top program overall due to its ease of learning and use. Not to mention its high rating score when it came to the error handling test.

So, if your business needs a charge, think POWER BASE, it might just be the spark you've been looking for.

POWER BASE™
from PAXUS.
Simply powerful.

POWER BASE is designed for IBM and compatibles. For more information call (02) 929 8844 or write to PAXUS Commercial Systems Pty. Ltd. (Incorporating Interactive Applications), P.O. Box 399, Milsons Point, 2061 N.S.W.

PAX 2005

Diagram-Master saves time

A powerful graphics tool for the IBM PC/XT/AT and compatibles, which produces presentation-quality diagrams, has been announced by Sourceware. Diagram-Master, developed by U.S. software house Decision Resources, provides a cost-effective method for simplifying complex business relationships through colorful and professional-looking graphics.

The inclusion of a free-form drawing board, with a library of 100 business shapes, allows users to select, position, size a shape and add the associated text. Diagram-Master is a menu-driven package which uses the full resolution power of over 80 plotters and printers, and offers eight typefaces, including a symbol font.

Diagram-Master $659

Sourceware
4/73 Albert Avenue
Chatswood NSW 2067 Australia
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The everyday floppy

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As a first time offering for intending Telecom Viatel users, High Technology has a "bundle" special of software and modem equipment available. The software; VTEX interfaces directly with Viatel. VTEX converts the user's computer into a fully supported graphics videotex terminal. Features provided include auto-dialling, auto log-on, on-screen help, page storage and retrieval together with graphics filtering to enable text only to be stored. Versions are available for IBM monochrome displays, color graphics displays and the IBM enhanced graphics adapter and display. VTEX is compatible with a number of computers; including IBM PC & XT (and compatibles). Graphics printing capability is available on the Epson range of printers.

The Multifunction range of modems is supplied with the software where the user may select either a manual dialling or Hayes compatible auto-dialling version for their particular application. Full implementations of the CCITT V21 & V23 are incorporated in the modems, and may also be configured for Bell standard operation. VTEX converts the split speed from V23 Viatel to standard operation, eliminating the need for baud rate converters.

Viatel "Bundle" $615 $740

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Scotch floppy disks: just check for compatibility.

New system for finance companies

Paxus Financial Systems has announced the Australian-designed *INCAS Wholesale Loans (Bailment) System*, software for finance companies which offer bailment or floorplan facilities for such organisations as motor vehicle dealers, heavy equipment suppliers and marine shops. The system is designed to help the finance company service its clients and keep track of all the stock it is financing.

It provides complete tracking of each unit on a floorplan through the use of automatically generated release numbers. Each unit has its own curtailment plan established and the finance costs are attributed directly to a unit. The system supports rate plus margin interest calculations and allows for mid-period rate changes.

The system provides valuable information for the dealer as well as satisfying the requirements of the finance company. This is in the form of detailed wholesale statements, unit ageing analyses and curtailment reports. Processing of curtailments is carried out automatically.

Extensive inquiry facilities are provided in the system. The user can go from a dealer inquiry to a unit inquiry by using details such as dealer name, release number, serial number, or engine number. Reports include sales tax and FID analysis, stock listings, credit control reports, audit trails and dealer usage reports.

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68000 power for PC and AT

Computer Transition Systems is offering the PRO68, a 68000 processor board for obtaining enhanced performance from the IBM PC, AT and compatibles. Appropriate applications for the PRO68 include Unix programs and software development, scientific and engineering calculations, 68000 software development, signal processing, industrial machine control, and parallel processing.

The PRO68 consists of a card for a full-sized IBM PC expansion bus slot. It contains a 68000 running at 10 MHz, up to 1 M of no-wait-state RAM, provision for a 32081 math chip, two serial ports, and a proprietary bus for addition of custom hardware and further memory. The design also allows both the PC and PRO68 to run independently.

Included with the PRO68 is either the Digital Research CPM68K or the Microware OS9 operating system. OS9 is a high performance Unix-like multitasking, multiuser system. PRO68 utilities provide for sending files to and from the host operating system. Another utility allows switching between DOS and the PRO68 operating system. Available high level languages include C, Fortran, Pascal, Basic, PLZ, LISP, and APL.

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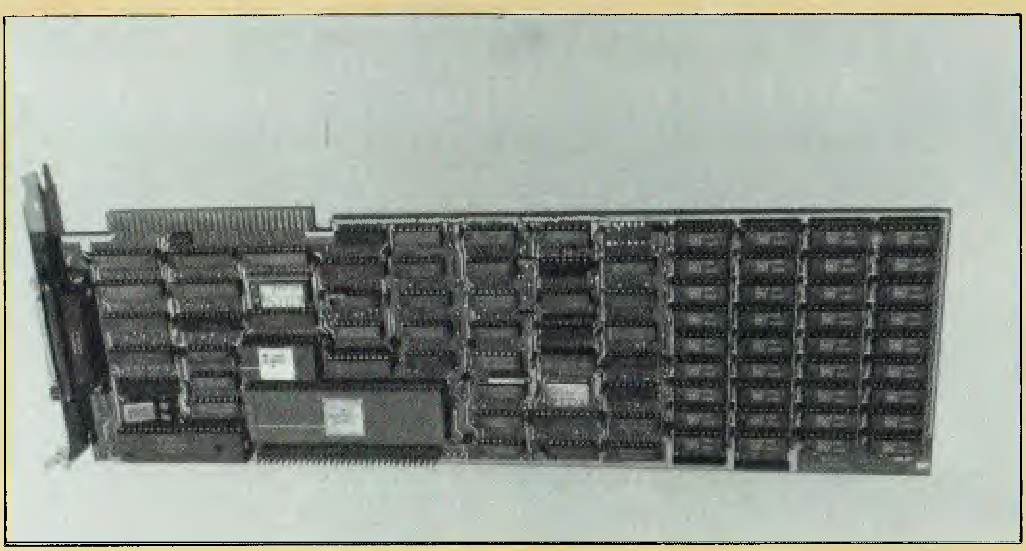

The PRO68: enhances performance from the IBM PC, AT and compatibles.

Pink PC

Pink Software has arrived with several task-oriented programs, each appealing to a specific market segment. Pink Software programs are available for IBM and compatible computers. *Asset Manager* appeals to all using computer systems that have no computerised method of maintaining data on their assets on an annual basis.

Cash Desk is a cash book general ledger package that will prepare the bank reconciliation each month. *Cash Desk* is for business people who utilise the services of external accountants to draw up their final year accounts, as well as for those who need to produce financial accounting reports for presentation to upper management. *Finance Desk* is the optional upgrade that incorporates budgeting and a report generator which will allow users to design any type of report.

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Cash Desk
Finance Desk

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SuperProject enhanced

An enhanced version of the project management package, SuperProject™, has been released by SORCIM/IUS, and will be available in Australia and New Zealand through ARCOM Pacific. The new version, SuperProject 1.10, includes a printing program that allows reports to be printed horizontally, and a number of printing enhancements. It is also possible to write reports to files that can be read directly by Lotus 1-2-3 and dBase.

SuperProject 1.10 also supports the Intel 8087 math co-processor, for increased speed in performing calculations. Additional devices supported include the IBM Enhanced Graphics Card and Monitor, the IBM Proprinter and Color Jetprinter, and the Epson FX printer extended character set.

SuperProject 1.1 $595

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Electronic filing system

Multisoft has been appointed exclusive distributor for the *filePro 16* range of software by The Small Computer Company of New York. *filePro 16* lets the user set up a menu-driven electronic filing system with either automatically-created or custom-designed screens, indexes, and reports. It maintains up to 16 million records per file, and up to 999 fields and 4,608 characters per record.

filePro 16 has the relational capabilities to move data between files automatically, and interfaces with spreadsheet programs such as Multiplan and with word processing programs such as Wordstar.

FilePro 16 $995

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Hard disk market

Consultech Australia has announced its appointment as Australian distributor for Microscience International Corp, floppy and hard disk drive manufacturer. The Microscience products now available through Consultech include a recently expanded range of half-height Winchester drives which are not limited to functioning horizontally. 20M Byte 5¼", 10M Byte 3½" and 10M Byte 5¼" models can operate in any position.

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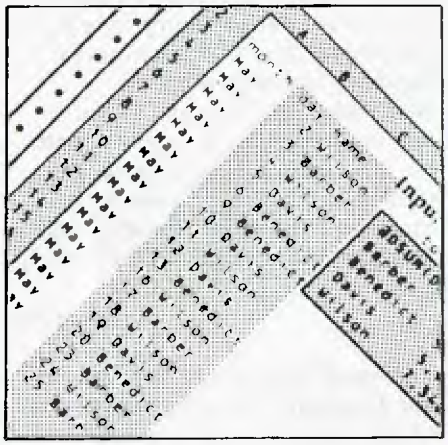
Calendar calculations



Spreadsheet Clinic invites submissions from PC Australia readers. If you have any hints, tips or patches which you would like to pass on to other PC users, send them in to the following address, and the lucky authors of items published will receive a complimentary box of diskettes.

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PC Australia
GPO Box 55A
Melbourne Vic 3001

This month I am presenting four letters about date arithmetic. *1-2-3* and *Symphony* use an index number to represent dates starting from 1-Jan-1900, which is day 1, up to 31-Dec-2099, which is day 73050.

However, a small error was made. It was assumed that the year 1900 was a leap year and a spurious 29-Feb-1900 was included. So every day since the first two months of 1900 is one day out, if you care to get excited about it. Of course it makes no difference unless you are comparing dates before and after the error.

The rule is that every four years is a leap year, except when the year is divisible by 100, although when it is divisible by 400 it is included as a leap year. This *Lotus* correctly counts the year 2000 as a leap year.

Which day of the week?

I have devised a *1-2-3* macro that will determine the day of the week for a day entered with the @DATE function (see figure 1).

Column A is a series of dates using the @DATE function; column B shows the results of running the macro, and the macro itself is in column D. You would start the macro with column B blank and with the cursor in cell B2 (the cell to the right of the first date in the column).

The macro requires one named range, RSLT, which is cell F9. It is used for doing modulo arithmetic on the date numbers. In Figure 1, the value in RSLT is 0, which is the remainder of the last date tested: 17-Mar-84. The macro also creates and deletes a range named DATE, so don't use that range name elsewhere in the spreadsheet.

The macro will figure out the day of the week, write it in the cell next to each data, and stop automatically when it comes to the end of the DATE column.

John Hunt

I would suggest only one minor improvement to this Macro. The line in D2 could be changed to include a Backspace:

{left}/rncDATE~{bs}~

This allows for the chance that DATE already exists as a range name (possibly due to a previously aborted run) and the cursor may jump to the old location. {bs} will eliminate the old range and return the cursor to its correct position. If DATE does not exist, it will do no harm.

Monday to Friday

I have found a very fast way to make *1-2-3* or *Symphony* list weekdays only.

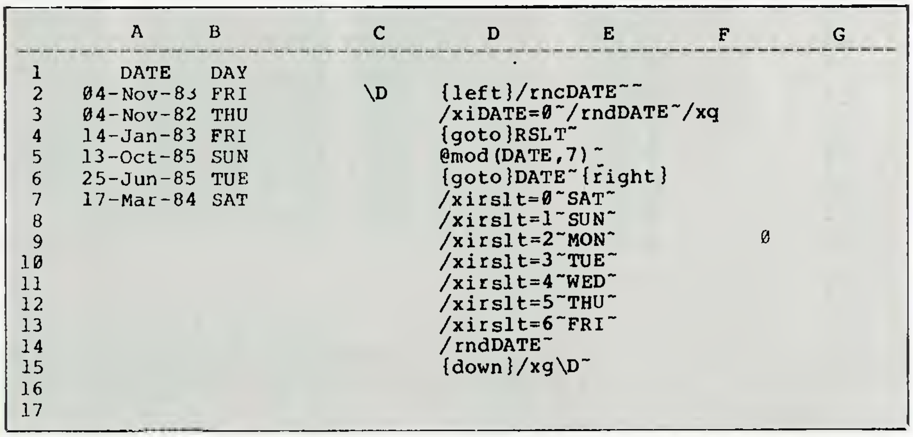
Enter the serial number for the first date in cell C3. In cell C4, enter this formula:

+C3+@IF(@MOD(C3,7)=6,3,1)

Copy this formula as far down the column as you like. With the date display format, you will get a list of weekday dates, as:

04-Apr-85
05-Apr-85
08-Apr-85
09-Apr-85

The formula works like this: If the value of @MOD(C3,7) (the remainder of the serial number in cell C3 divided by 7) is 6, then that date is Friday. This means that you must add 3 to the date in cell C3 to get the next date, Monday. If the value of @MOD(C3,7) is not equal to 6, you



```
        A         B               C        D          E          F          G
-------------------------------------------------------------------------------
 1        DATE    DAY
 2   04-Nov-83 FRI           \D      {left}/rncDATE~~
 3   04-Nov-82 THU                   /xiDATE=0~/rndDATE~/xq
 4   14-Jan-83 FRI                   {goto}RSLT~
 5   13-Oct-85 SUN                   @mod(DATE,7)~
 6   25-Jun-85 TUE                   {goto}DATE~{right}
 7   17-Mar-84 SAT                   /xirslt=0~SAT~
 8                                   /xirslt=1~SUN~
 9                                   /xirslt=2~MON~                0
10                                   /xirslt=3~TUE~
11                                   /xirslt=4~WED~
12                                   /xirslt=5~THU~
13                                   /xirslt=6~FRI~
14                                   /rndDATE~
15                                   {down}/xg\D~
16
17
```

Figure 1: A macro that derives the day of the week in Lotus's 1-2-3.

just add 1 for the next day of the week.

If you are using *Symphony*, you can also use the @CHOOSE function to print the day of the week, as:

04-Apr-85	Thu
05-Apr-85	Fri
08-Apr-85	Mon
09-Apr-85	Tue

The following formula, copied as far down as you like, will do the job:

@CHOOSE(@MOD(C3,7),@ERR, @ERR,“Mon”, “Tue”, “Wed”, “Thu”, “Fri”)

Stan Scott

This is taking full advantage of @MOD. If you have Release 2 of 1-2-3 you can use @CHOOSE in the same way as Symphony *to return character string results. If you still have release 1A*, then you can use the more long winded macro in the next letter.*

How to find Thursday

Our accounting week always ends on Thursday, and I often need to insert that date into a *1-2-3* worksheet. I have found a way to determine the next Thursday's date, no matter which day of the week I happen to be running the program.

The procedure, which is outlined in Figure 2, uses the @VLOOKUP function instead of a macro. It starts in cell C19, with a formula (displayed to its immediate right) that subtracts the date of some past Thursday from today's date and then divides the remainder by 7. I used January 3, 1985, but any Thursday from the past will be good enough.

The integer part of the results in C19 will change by one for each succeeding week, but the fractional part is the same for every Monday, Tuesday or Wednesday, on which the calculation is done. The fraction that remains after subtracting the integer portion of C19 (this is done in cell C21) can therefore always be used to figure the number of days between today and Thursday. Cell C23 tests this fraction against the table in cells C25 . . D32 to find the number, which is subtracted from today's date in cell G26, to give the date for last Thursday. Since, in this example, today is Friday, you subtract 1 from today's date; if today were Tuesday, the procedure would subtract 5, and so forth. To find the date for next Thursday, just add 7 to the formula in G26.

Once you know the date of a specific day of the week, you can build a calendar by adding to last Thursday's date. At the bottom of Figure 1, Thursday is G26+7, Wednesday is G26+6, and so on.

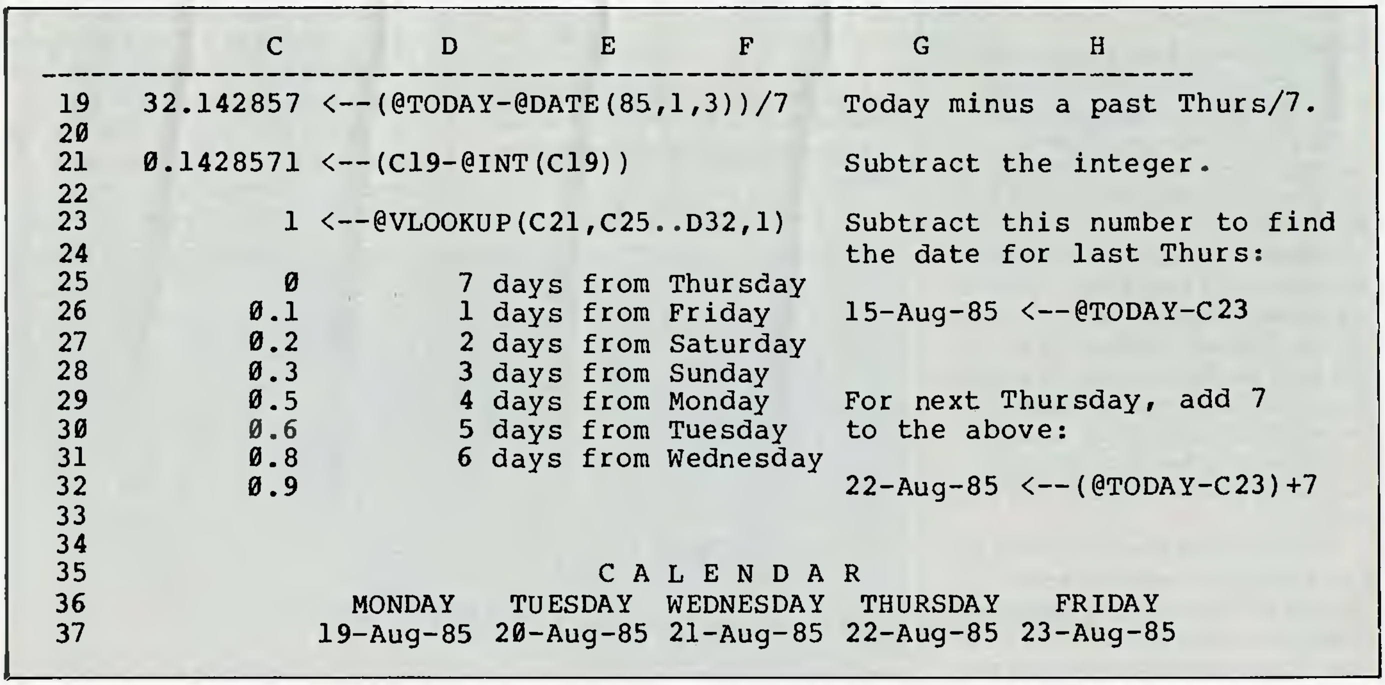
If you always want to get the date for Thursday of the *next* week, you need only change the values for Monday, Tuesday, Wednesday, and Thursday in cells D25 . . D31 from 4, 5, 6, and 7 to -3, -2, -1, and 0.

Dick Aitkins

A much simpler way to calculate last Thursday is the following formula which is all you would need to calculate G26:

@NOW-@MOD(@NOW-@DATE(85,1,3),7)

@MOD divides the first argument by the second and returns the remainder, which in this case is the number of days since last Thursday. @MOD is very useful in general in date or time calculations or in any number system which runs through cycles.



```
             C          D         E         F          G          H
 ----------------------------------------------------------------
 19   32.142857 <--(@TODAY-@DATE(85,1,3))/7   Today minus a past Thurs/7.
 20
 21   0.1428571 <--(C19-@INT(C19))            Subtract the integer.
 22
 23           1 <--@VLOOKUP(C21,C25..D32,1)   Subtract this number to find
 24                                           the date for last Thurs:
 25           0          7 days from Thursday
 26         0.1          1 days from Friday   15-Aug-85 <--@TODAY-C23
 27         0.2          2 days from Saturday
 28         0.3          3 days from Sunday
 29         0.5          4 days from Monday   For next Thursday, add 7
 30         0.6          5 days from Tuesday  to the above:
 31         0.8          6 days from Wednesday
 32         0.9                               22-Aug-85 <--(@TODAY-C23)+7
 33
 34
 35                          C A L E N D A R
 36                MONDAY   TUESDAY  WEDNESDAY  THURSDAY   FRIDAY
 37             19-Aug-85 20-Aug-85 21-Aug-85 22-Aug-85 23-Aug-85
```

Figure 2: Formulae that will always return the date of next Thursday; in this example “today” is Friday, August 16.

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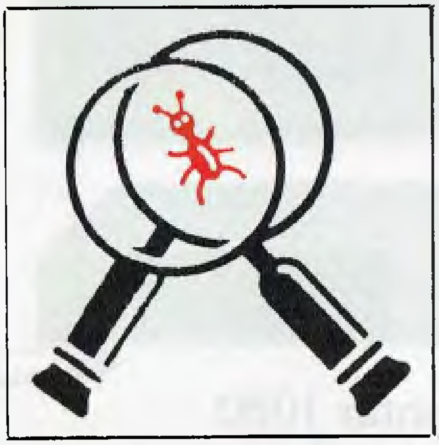
Printer hints



User-to-User invites submissions from PC Australia readers. If you have any hints, tips or patches which you would like to pass on to other PC users, send them in to the following address, and the lucky authors of items published will receive a complimentary box of diskettes.

User-to-User
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Switching parallel printers

If you have a second parallel printer port on your PC you are probably wondering how to use it! Many packages do not recognise the fact that up to three printers can be attached to a PC, and the MODE command will not re-direct regular printed output to any other printer except LPT1.

From the IBM Technical Reference Manual you can verify that the output port addrrss for LPT1 is contained in absolute memory locations 1032 and 1033, LPT2 in 1034 and 1035, and LPT3 in 1036 and 1037. The status port for each printer can be obtained by adding one to the port address. By swapping the printer adapter port addresses you can switch printers.

The following BASIC program will swap LPT1 with LPT2:

```
LPTPORT.BAS
100 DEF SEG=&H40
110 'Read port addresses
120 PORT.1.LOW=PEEK (8)
130 PORT.1.HIGH=PEEK (9)
140 PORT.2.LOW=PEEK (10)
150 PORT.2.HIGH=PEEK (11)
160 'Write port addresses in reverse
    order
170 POKE 8, PORT.2.LOW
180 POKE 9, PORT.2.HIGH
190 POKE 10, PORT.1.LOW
200 POKE 11, PORT.1.HIGH
```

Debra Martinelli

This little piece of code certainly has its uses. Imagine being able to swap between a high speed dot matrix printer used for draft copies and a daisywheel, or a plotter!

Using the same principles you can create a .COM file to perform the same function. The following is an example of a DEBUG session to create a file called LPTPORT.COM:

```
A>DEBUG
-A

1EFF:0100 MOV CX,DS
1EFF:0102 MOV AX,0040
1EFF:0105 MOV DS,AX
1EFF:0107 MOV AX,[0008]
1EFF:010A MOV BX,[000A]
1EFF:010E MOV [0008],BX
1EFF:0112 MOV [000A],AX
1EFF:0115 MOV DS,CX
1EFF:0117 RET
1EFF:0118
-N LPTPORT.COM
-R CX
CX 0000
:18
-W
Writing 0018 bytes
-Q
```

If on the other hand you happen to be a dBase *II fanatic, here is a short dBase II program that is based on the same code:*

```
* LPTPORT.PRG dBase II Ver 2.4
* Program to switch LPT1 with LPT2
set call to 58000
poke 58000, 140, 217, 184, 064, 000
poke 58005, 142, 216, 161, 008, 000
poke 58010, 139, 030, 010, 000, 137
poke 58015, 030, 008, 000, 163, 010
poke 58020, 000, 142, 217, 195
call
return
```

As a final comment, I understand the same principles can be applied to communication ports!

Is that printer awake?

A nice feature in any program is the ability to check if the printer is on line before sending anything out to it, preventing a possible program crash. We can do this in BASIC programs by checking the value of the printer status port. If a decimal 233 is returned, this indicates that the printer is on line. Anything else means it is not.

To try this yourself, insert the lines in *Figure 1* into your BASIC

```
100 REM — Printer test
110 DEF SEG=0
120 PORT.ADDRESS=PEEK (1032)+PEEK (1033)*256+1
130 IF INP (PORT.ADDRESS) =223 THEN 180
140 PRINT "Your printer is not on-line."
150 PRINT "Fix, then hit any key."
160 I$=INKEY$: IF I$="" THEN 160 ELSE 130
170 REM — — The program continues here
180 BEEP: rem — if beeps, printer is on-line
```

programs to tell you whether the printer is actually on line:

Bert Sirkin

This works well (for LPT1) and is far less trouble than using ON ERROR . . . GOTO trapping. The program won't proceed unless the printer is switched on and is on-line.

To modify the program to test LPT2 change line 120 to:

```
120 PORT.ADDRESS=PEEK
(1034)+PEEK (1035)*256+1
```

For LPT3, change line 120 to:

```
120 PORT.ADDRESS=PEEK
(1036)+PEEK (1037)*256+1
```

If the value of PORT.ADDRESS is zero then the printer is not attached to the system.

High capacity problems

With the release of the AT and the high capacity (1.2M) floppy disk drives comes a new problem — disk incompatibility.

While a 360K drive will not read or write in the high capacity format, a high capacity drive can read and write in single sided (180K) or double sided (360K) formats. The problem is that once the data on a disk has been modified by a high capacity drive it cannot be reliably used in the older single/double sided drives.

This causes a number of problems. Two in particular are the fact that disk data can only be reliably transferred one way and that using a copy-protected disk in a high capacity drive means it may not be readable in a 360K drive.

While there is no reliable way of transferring data from a high capacity drive to a 360K drive, there is one method that will work most of the time. First, format a diskette on a 360K drive, place the diskette in a high capacity drive, copy the required data to the disk and then try to read the data back in on the 360K drive.

If you are going to be using copy-protected disks in high capacity drives you will have to be careful or else the disks may be rendered useless in a 360K drive.

Jeff Setter

We would do well to take note of Jeff's warning. Probably the best way to avoid these problems is to purchase your AT with two disk drives; one high capacity and one 360K. The suggested method of transferring data back seems to work but I would always keep in mind that famous corollary to Murphy's Law — "It is always the most critical piece of data that won't copy".

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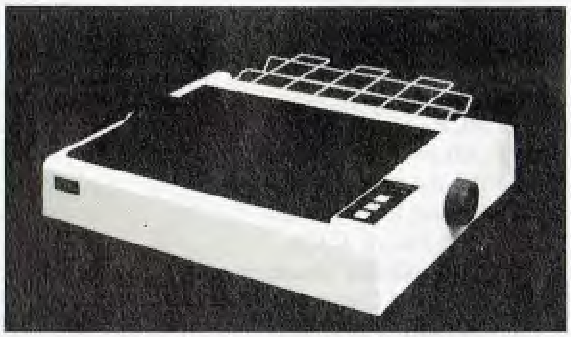

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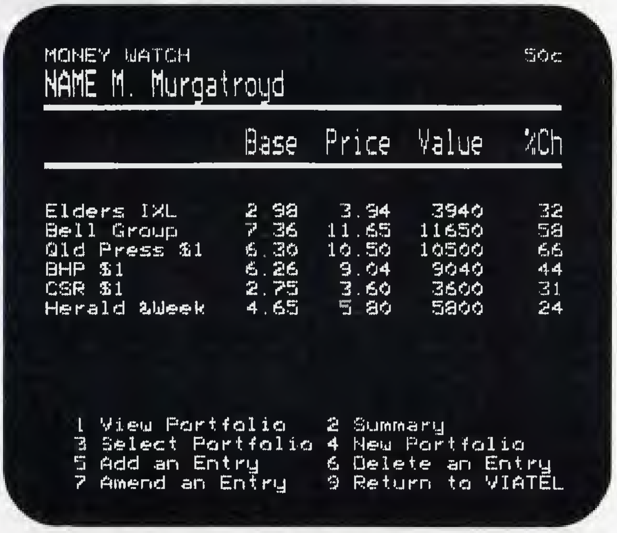

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TECH NOTEBOOK

8

We interrupt this program

Ted Forgeron explains how the default Ctrl-Break interrupt handler can be replaced with customised routines.

IBM recommends that programs be designed to "interrupt the current process" whenever a Ctrl-Break is detected. Pressing Ctrl-Break will abort most PC-DOS commands; it is the special handling of Ctrl-break by the BIOS and DOS that allows these programs to be interrupted.

Both PC-DOS and the ROM BIOS treat Ctrl-Break as a special key. The BIOS sets a flag whenever its low-level key-board handler detects that Ctrl-Break has been pressed. When DOS notices that the flag has been set, it executes a software interrupt to invoke the system default Ctrl-Break interrupt handler. The default Ctrl-Break interrupt handler can easily be replaced with a customised version, so that this same Ctrl-Break detecting capability can be incorporated into an applications program. An interrupt handler is nothing more than a subroutine that gets control when a particular interrupt is executed. In this case, DOS executes a software interrupt 23H when it detects that Ctrl-Break has been pressed.

The listing below, BREAK.ASM, shows four routines that can be used for setting up and detecting Ctrl-Break. All four can be called from Pascal, C, or assembly language programs.

INSTALL is responsible for placing the address of the new Ctrl-Break interrupt handler into the correct spot in the interrupt-vector table. Interrupt vectors are used so that DOS can find the Ctrl-Break interrupt handler without having to know its address in advance. A call to INSTALL should be placed near the beginning of programs that will use this Ctrl-Break detecting routine.

BREAK_HANDLER is the actual Ctrl-Break interrupt handler. As the listing shows, this routine simply sets a flag to signify that Ctrl-Break has been pressed. Applications programs do not need to call BREAK_HANDLER; it is called automatically when DOS executes INT 23H.

CHECK_BREAK is a boolean function that can be called in order to see if Ctrl-Break has been pressed.

REMOVE puts the address for the original DOS Ctrl-Break handler back in the interrupt vector. Applications programs should call REMOVE just before exiting. ■

Ted Forgeron is vice-president of systems software engineering at Multisoft Corporation.

LISTING: BREAK.ASM

```
        TITLE   BREAK -- Break Handling Utilities Module

TRUE            EQU      01H             ; boolean true
FALSE           EQU      00H             ; boolean false
BREAKINT        EQU      23H             ; dos control-break intrpt
GETVECTOR       EQU      35H             ; dos get vector function
SETVECTOR       EQU      25H             ; dos set vector function
DOS_FUNCTION    EQU      21H             ; dos function call

BREAK SEGMENT PUBLIC 'CODE'
BREAKFLAG       DB       0               ; break key hit flag
SAVEBREAK       DD       0               ; saved break vec. contents
        ASSUME  CS:BREAK
        ASSUME  DS:NOTHING

; CHECK_BREAK checks if ctrl-break has been pressed.  It returns
; true if ctrl-break has been pressed and false if it hasn't.

        PUBLIC  CHECK_BREAK
CHECK_BREAK     PROC FAR
        XOR     AX,AX                   ; clear ax
        MOV     AL, BREAKFLAG           ; return value = breakflag
        MOV     BREAKFLAG, FALSE        ; reset break flag
        RET
CHECK_BREAK     ENDP

; INSTALL_BREAK_HANDLER sets up a ctrl-break interrupt handler. It
; also saves the address of the former break handler so that it can
; be restored later.

        PUBLIC  INSTALL_BREAK_HANDLER
INSTALL_BREAK_HANDLER PROC FAR
        PUSH    DS
        MOV     AL,BREAKINT             ; AL = break interrupt
        MOV     AH,GETVECTOR            ; AH = dos function code
        INT     DOS_FUNCTION            ; call dos
        MOV     WORD PTR SAVEBREAK,BX   ; save offset in int vector
        MOV     WORD PTR SAVEBREAK+2,ES ; save base in int vector
        MOV     AL,BREAKINT             ; AL = break interrupt
        MOV     AH,SETVECTOR            ; AH = dos function code
        MOV     DX,OFFSET BREAK_HANDLER ; DX = offset of brk hdlr
        MOV     BX,CS                   ; BX = this segment
        MOV     DS,BX                   ; DS = this segment
        INT     DOS_FUNCTION            ; call dos
        POP     DS
        RET
INSTALL_BREAK_HANDLER  ENDP

; BREAK HANDLER is invoked by the bios when ctrl_break is pressed.

BREAK_HANDLER   PROC FAR
        MOV     BREAKFLAG, TRUE         ; breakflag = yes, break hit
        IRET
BREAK_HANDLER   ENDP


; REMOVE BREAK HANDLER restores the previous ctrl-break handler.

        PUBLIC  REMOVE_BREAK_HANDLER
REMOVE_BREAK_HANDLER PROC FAR
        PUSH    DS
        MOV     AL,BREAKINT             ; AL = break interrupt
        MOV     AH,SETVECTOR            ; AH = dos function code
        MOV     DX,WORD PTR SAVEBREAK   ; DX = saved 1st word
        MOV     BX,WORD PTR SAVEBREAK+2 ; BX = saved 2nd word
        MOV     DS,BX                   ; DS = saved 2nd word
        INT     DOS_FUNCTION            ; call dos
        POP     DS
        RET
REMOVE_BREAK_HANDLER ENDP
BREAK   ENDS
        END
```

TECH
NOTEBOOK

9

Double trouble

Paul Hultquist shows how accurate double-precision calculations in IBM BASICA require specific procedures.

BASICA's double precision must be handled carefully or it will return only single-precision results. Versions 2.0 and later of IBM BASIC contain a cryptic note in the manual indicating that if the user types BASIC/D or BASICA/D, he will be blessed with double-precision versions of SIN, COS, TAN, ATN, EXP, LOG and SQR. But beware — a comparison of BASIC's double-precision results and tabulated values can be disappointing. In one test case, the double-precision functions evidenced only single-precision accuracy.

Further investigation revealed the problem; the double-precision BASIC functions are accurate, but it is necessary for the user to know exactly how BASIC handles double precision in order to use the functions correctly.

First, double-precision functions must receive double-precision arguments. If the argument is a variable it must be declared double precision by a DEFDBL declaration or by adding the suffix #, as in X# = something. Simply declaring the argument variable double precision is not enough, as figure 1 shows. Unless one or more of the numbers on the right side of the argument's assignment statement is double precision, the right side will be evaluated in single precision and converted to double. (Note that the conversion of a single-precision 1/3 yields a peculiar double-precision value.)

Figure 2 illustrates another point. Computing 4* ATN (1) is a good method for obtaining an accurate value of pi. Note that 4.0*ATN (1.0) produces a poor value of pi while 4.0*ATN (1.0#) yields a value that is correct to 16 digits. When a function is called with a single-precision argument, the single-precision version of the function is used, even when the statement's left side contains a double-precision variable. The single-precision function result is converted to double precision.

When in doubt, overkill in the use of double-precision declarations. Similarly, declare numbers or constants in double precision to ensure that the functions are given true double-precision arguments. (Note that, as figure 3 shows, INPUT numbers to double-precision variables are handled properly.)

Comparisons show that the double-precision values are accurate, in spite of occasional round-off errors (about one every twenty values). To round a positive number properly, add 5 (decimal) or 1 (binary) to the first omitted place and truncate the number. A more intricate process than single precision, double precision is also slower; interestingly enough, it carries more than 16 digits, but no convenient way exists to display the entire value. ■

Paul Hultquist is a professor of electrical engineering

FIGURE 1: *Double-precision Division*

```
X#=1.0/3.0
Ok
PRINT X#
 .3333333432674408
Ok
X#=1.0#/3.0
Ok
PRINT X#
 .3333333333333333
Ok
X#=1.0/3.0#
Ok
PRINT X#
 .3333333333333333
Dk
X#=1#/3#
Dk
PRINT X#
.3333333333333333
```

FIGURE 2: *Calculating Pi*

```
10 DEFDBL A-H, O-Z
20 A=4!*ATN(1!)
30 PRINT A
40 A=4!*ATN(1#)
50 PRINT A
Ok
RUN
 3.141592979431152
 3.141592653589793
```

FIGURE 3: *Using INPUT*

```
10 INPUT A#
20 INPUT B#
30 X#=A#/B#
40 PRINT X#
Ok
RUN
? 1
? 3
 .3333333333333333
```

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Contact: Tim O'Connor (03) 830 5067
Time: 6.00pm second Wednesday
Venue: Clunies-Ross House
191 Royal Parade
Melbourne

Sydney PC User Group
Contact: Ana Calligeros (02) 290 3655
Time: 5.45pm third Monday
Venue: Price Waterhouse
11th Floor, 50 Bridge Street
Sydney

Perth PC Micro Users Group
Contact: Tony Farrell (09) 481 0011
Time: 5.30pm first Tuesday
Venue: CTA
54 Havelock Street
West Perth

IBM-PC Users Groups (SA)
Contact: Don Richards (08) 261 9590
Time: 7.30pm first Thursday
Venue: 173 Wakefield Street
Adelaide

ACT PC Users Group
Contact: Nick Hammond (062) 86 1102
Time: 8.00pm fourth Monday
Venue: Main Lecture Room
Canberra TAFE (Reid)
Canberra

The Illawarra IBM-PC Club
Contact: Ken Jeffrey (042) 74 0442
Time: 7.30pm first Tuesday
Venue: John Lysaght
Springhill St Training Centre
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South Australia	
Adelaide User Group	(08) 271 2043
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Contact: Richard Womack (02) 997 1554
Meetings: 6.15pm 2nd Wednesday
MTE Centre 2nd Floor
cnr York and Market Sts Sydney

dBase Users Group
Address: PO Box 297
Neutral Bay Junction NSW 2089
Contact: Maria Lengas (02) 908 3458
Meetings: 6.30pm 1st Tuesday
MTE Centre 2nd Floor
cnr York and Market Streets Sydney

Turbo Pascal Users Group
Address: 73 Outram Street
West Perth WA 6005
Contact: Aaron Regan (09) 322 1834
Meetings: 7.30pm 2nd Tuesday.
2/294 Rokeby Rd Subiaco WA

NOTICE

If you have any further PC community information for this bulletin board, contact the Editor, Ian Robinson on (03) 602 4122

PC AUSTRALIA The interactive guide to IBM PCs and compatibles

PERTH PC MICRO USERS GROUP

The next meeting of the Perth PC Micro Users Group will be held on February 4th at 5.30pm at CTA House.

The subject of the meeting is "VIDEOTEX AND THE DISTRIBUTION OF BIRTHDAY CAKES" and will be presented by Peter Humphries, chairman of the Videotex Association of Western Australia.

SPECIAL INTEREST GROUPS

The PC User Group in Sydney has spawned a number of special interest sub-groups (SIGs), which meet monthly at the Coopers & Lybrand Auditorium in Bligh Street at 5.45 pm on the following dates:

GENSIG — General Discussion Group — first Tuesday. Contact: Dan Lawrence (02) 232 7866

COMSIG — Communications Group — second Monday. Contact: Geoff May (02) 699 3518

DATASIG — Database and Spreadsheet Group — fourth Tuesday. Contact: John Pitera (02) 499 2400

Lotus User Groups

Melbourne

Contact: Robert Taylor (03) 267 4800
Time: 5.30pm first Tuesday
Venue: Light Car Club
46 Queens Road
Melbourne

Sydney

Contact: Ron Pollak (02) 290 3655
Time: 5.45pm first Thursday
Venue: Deloitte Haskins & Sells
7th Floor, 16-18 Bent Street
Sydney

Perth

Contact: Peter Foreman (09) 322 4899
Time: 5.30pm first Tuesday
Venue: Australian Bank
2nd Floor, 190 St George's Tce
Perth

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Contact: Paul Wragg (08) 223 5711
Time: 7.30pm first Tuesday
Venue: 173 Wakefield Street
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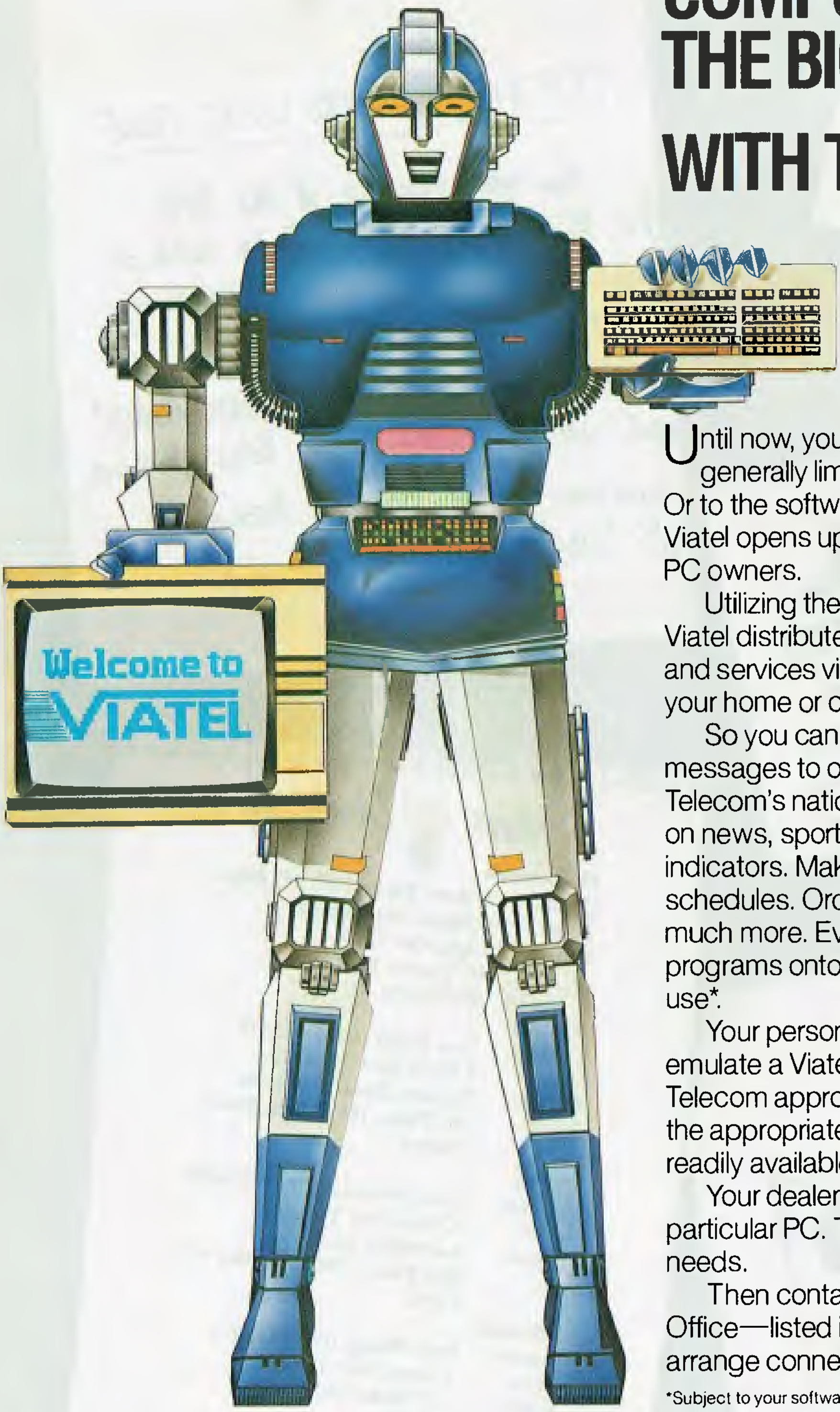

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Breaking the price barrier

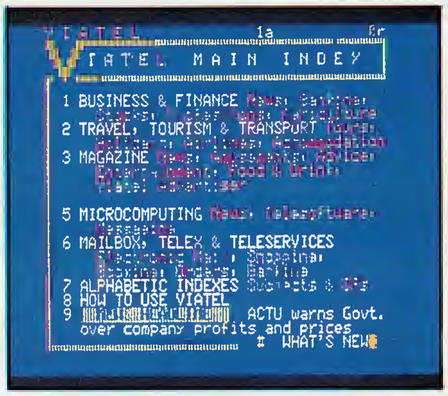
After reading through this month's feature on PC videotex, you've probably decided to check it out for yourself, that is if you're not a videotex subscriber already. Those who have hesitated until now may have been wise, as an important price breakthrough was recently announced by Datasat Australia — a complete PC videotex package for $395.

This sales tax inclusive price undercuts most comparable systems by several hundred dollars and, with a bit of luck, should spark off PC videotex price wars throughout the next few months. I have said it before and I will say it again — 1986 is going to be a hot year for PC videotex.

The complete Datasat multifunction communications package includes the Datasat V1275 modem, telephone handset and a specially modified version of the VTEX communications software which can handle standard 300 baud BBS transmissions as well as the 1200/75 videotex split rate. Besides the IBM PC itself, machines tested with the Datasat package include the Tandy 1000, NEC APC III, Texas Instruments Professional, Olivetti M24 and M21, Sanyo 775 and the President 16.

Plans are under way to build telesoftware capability into the Datasat package, which will result in a very competitive product indeed. Most videotex software offerings do not yet support telesoftware, which will become an increasingly important prerequisite for PC users as time goes by. This is not to say that other videotex software developers have been standing still — news reaches my desk each day of further improvements and niceties being added to existing packages.

Service providers on Viatel are gradually waking up to the fact that a large proportion of their customers are accessing them through PCs, with the result that many SPs have rearranged their information in a manner more suitable for this audience. If you look hard, you might even discover a partial directory of PC user groups within the Microtex section, although the list is woefully inadequate, and ignores the two largest and most influential PC user groups in the country. Hopefully, this situation will soon change, once MELB-PC and the Sydney PC User Group notice the omissions. Besides, if you want to see the authoritative list of all the user groups that really matter, check out the PC videotex bulletin board or the notes on the preceding pages.



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9 ACTU warns Govt. over company profits and prices
WHAT'S NEW

The latest PC videotex package to be subjected to my selective scrutiny is Xyllyx (God knows what it stands for, but it reads the same in reverse) from Rank Electronics. The Xyllyx package comprises the versatile Sendata 1000 external modem bundled with Multicom software, and a modified ROM for the standard IBM Color Graphics Adapter. Apparently, Rank Electronics offers the package for a variety of microcomputers (the others of which shall remain nameless) and the major difference between each is the ROM supplied. Obviously, some systems may have sophisticated enough graphic capabilities not to require a ROM, but the IBM PC, as everybody knows, is sadly lacking in the color graphics department.

I found that operating the manual Sendata modem was a bit of a step down, after having been spoilt for many months by my trusty auto-dialling In/Modem, but nevertheless the hand-dialling was not too painful. (I had almost forgotten the 01955 Viatel number — at least there are only five digits.) Once connected, the differences between the modems are hardly noticeable, as you become more interested in what is coming down the line. The software employed is a version of *Multicom* — a functional package which has gained a good deal of support from its users over the last year or so.

The Xyllyx documentation, while nowhere near the top class standard that PC software aficionados have come to expect from imported products, is legible and concise. It also has the added advantage of being in a ring-bound cover, so that the pages lie flat when you are hard at it with both hands on the keyboard.

While not quite as competitively priced as the new Datasat offering, Xyllyx is definitely worth consideration by the prospective PC videotex user. But remember — careful consideration is required before you decide upon the appropriate videotex hardware and software for your PC, and price is only one of the factors. You must also take into account your hardware configuration — whether it is color or monochrome, whether it can handle the full eight colors at full resolution, and whether your existing modem can handle the split baud rates required for videotex. Some compatibles, such as that produced by Philips, even come bundled with videotex software so that only an appropriate modem is required.

In any case, once the decision has been made, I can guarantee you won't be disappointed by the new world that PC videotex opens up for you.

See you next month. ■

Don't invest in a laser printer …until you have read this month's issue of

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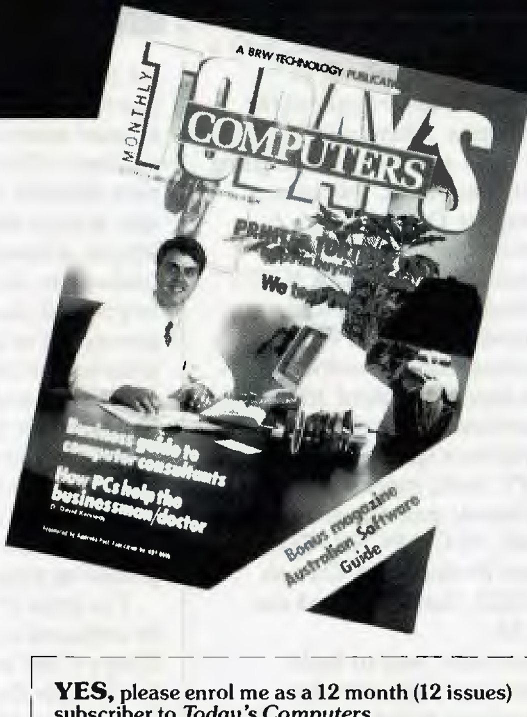
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Coming up

February will see a bigger and better issue of PC Australia than ever before! The second article in our popular expansion board series will feature accelerator boards — turbocharging hardware that can give any PC a new lease of life. For the more technically inclined, we include an analysis of random number generation by PC, along with a large collection of BASIC source code listings so that you can examine the various methods yourself. (Remember, if you don't want to let your fingers do the walking, there is always the easy way out — just send in for a PC Disk.)

Clive Lassiter will be back to check out another competitive compatible, **Vi Adelle** will uncover more of the wonders of PC videotex, **Ron Pollak** will reveal more users' discoveries, **John Green** will present some more spreadsheet magic and, of course, **Les Stein** will let loose upon some other unfortunate facet of the PC industry. Any true PC user worth his default drive will not miss it!

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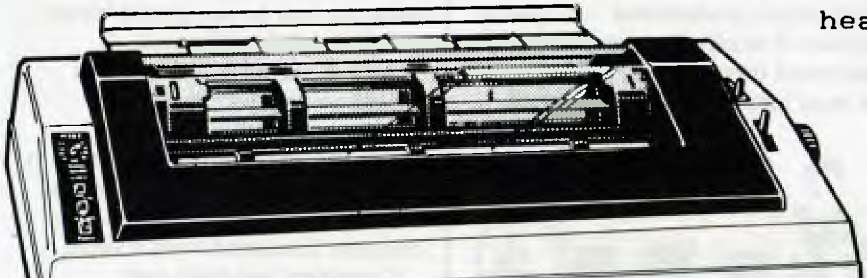

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New York, New York

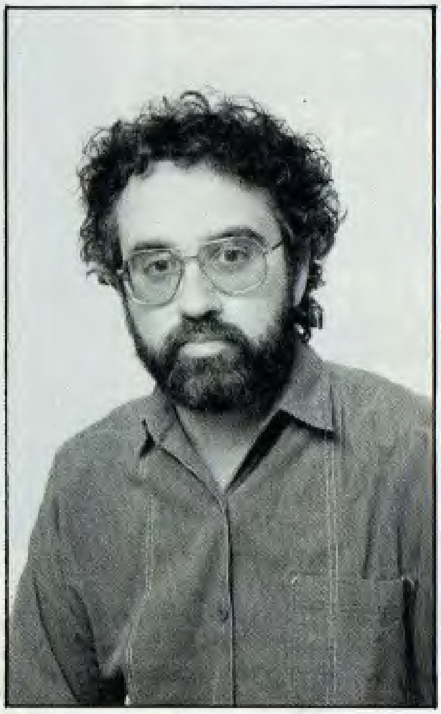
In my first week in New York city a man pointed a gun at me because I accidentally bumped into him on the street. The local computer industry is just as insane. Sure, if you are a prospective customer they will kiss your feet. If you stand around with no intention of buying and cannot be turned into cash, you could be eaten alive.

There is no longer any fun or excitement in the New York computer scene. It has become the new used-car market which contains more liars than Darwin has flies. Anybody will sell you anything for whatever they can get.

In my three months here I have made a pilgrimage to one computer store after another. I have trod the aisles of a dozen major extravaganza shows and I have tried to talk to all the local computer luminaries. The sentiment is palpable — something has died here. Everyone is sick of the whole industry —there is no enjoyment to be found in computers.

Now everybody is impatient. I was standing in a downtown store when a disgruntled customer came in and smashed his machine on the floor. Nobody really looked up. Apparently (I was not about to approach such a moron) he had had a hard disk failure. What would we do in Australia? Probably just chat for a while with the dealer and commiserate about how these new-fangled inventions sometimes backfire.

The competition in New York is ruthless. Stores shut down overnight, unable to compete with the 'grey market' —made up of the excess machines that result when retailers buy in bulk to get discounts. The irony is that the extra stock finds its way into their own market and eventually forces out the retailers who supplied them in the first place. As a result, branches of large operations such as ComputerLand keep on sinking beneath the waves.



New Yorkers are not known to be polite, but the computer variety is particularly nasty. If you walk into a shop looking other than a yuppie (young urban professional — if you've been out of touch) or a tycoon, you could stand there all day. In this city you must look loaded to get service.

Want to test a program? Buy it. I was relieved one day in the software section of a massive bookstore to meet a solicitous salesman who offered to demonstrate any program I fancied. I asked another customer why this store was so different. "Look at the prices," he said. Sure enough — way over the recommended retail price.

Then there is that extra special New York computer quality. Police recently closed down a local electronic bulletin board which was being used to keep a list of child prostitutes. No need for a list of normal prostitutes — they advertise regularly on a New York TV station. In my bulletin board wanderings I came across a 'clean girl' list. Apparently, one out of four New York hookers has AIDS —this is a list of those who have been medically tested. The dark side of ruthless competition has offered me a few bargains that I have snapped up. A 20M hard disk for $400, a 4M memory board for $300 and a color board for $50. Anyway I am only visiting — what is all the fuss about?

I am worried for the industry in Australia. The head of a huge software house asked me, "Is there a market to be squeezed in Australia?" The big squeeze is coming as US companies set up offices in Australia and confuse us with promises and marketing hoopla. A big event for the Australian computer press is supposed to be some big shot money maker telling us how he has graced 'down under' (ha, ha) with a visit.

All this stuff is pouring out of America along with what New Yorkers call "attitude". The Australian PC industry is starting to develop a new breed of person who will slap you on the back and utter complete falsehoods with a smile.

Computers are tools and commodities. Up until now we have had a healthy excitement about PCs participated in by consumers and industry. Intelligent sales people have helped local business to modernise and to take advantage of appropriate technology. In most cases, you were sold what you needed or could use — no over inflation or lies.

I hope that we look where we are going. I have always thought New York was a great place to visit but I wouldn't want to live here. ■

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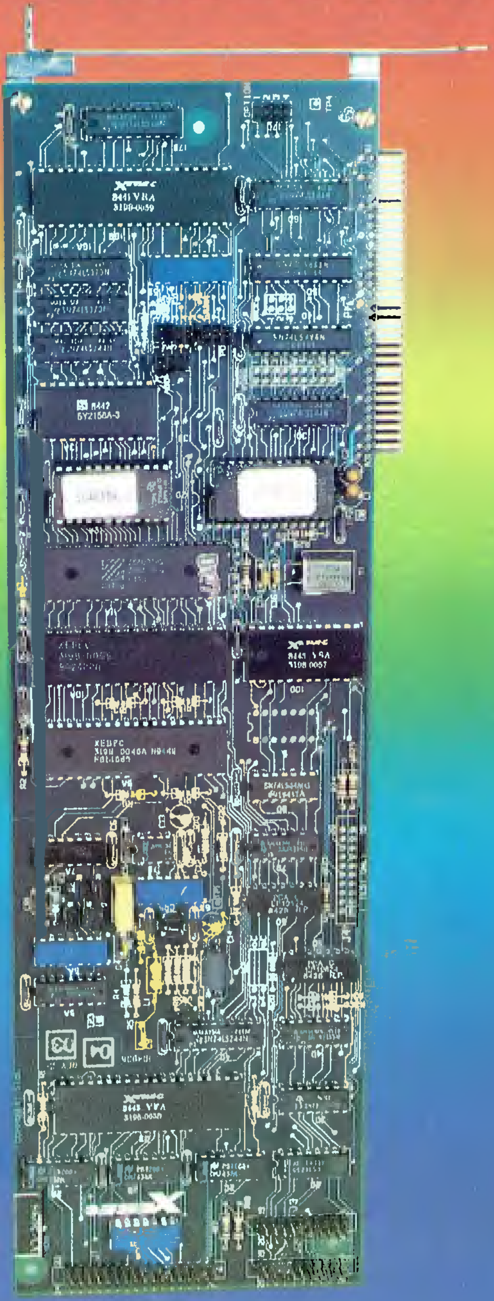

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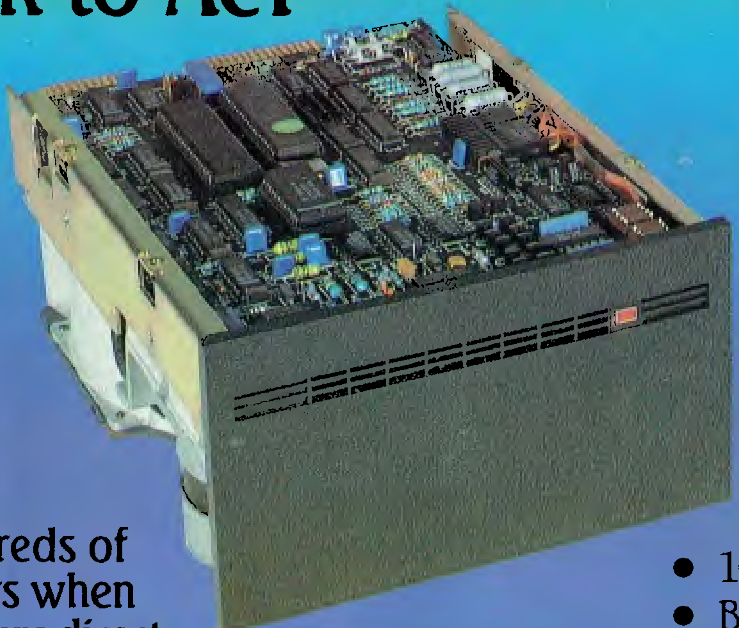

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